

# S<sup>3</sup> SDSU STUDENT SYMPOSIUM

The SDSU Student Symposium is open to all students and majors! We hope to see you and your excellence there.

# innovation

INNOVATION  
CREATIVITY  
DISCOVERY

it's our  
culture

#### LOCATION

Conrad Prebys  
Student Union

#### DATE

March 1 & 2, 2024



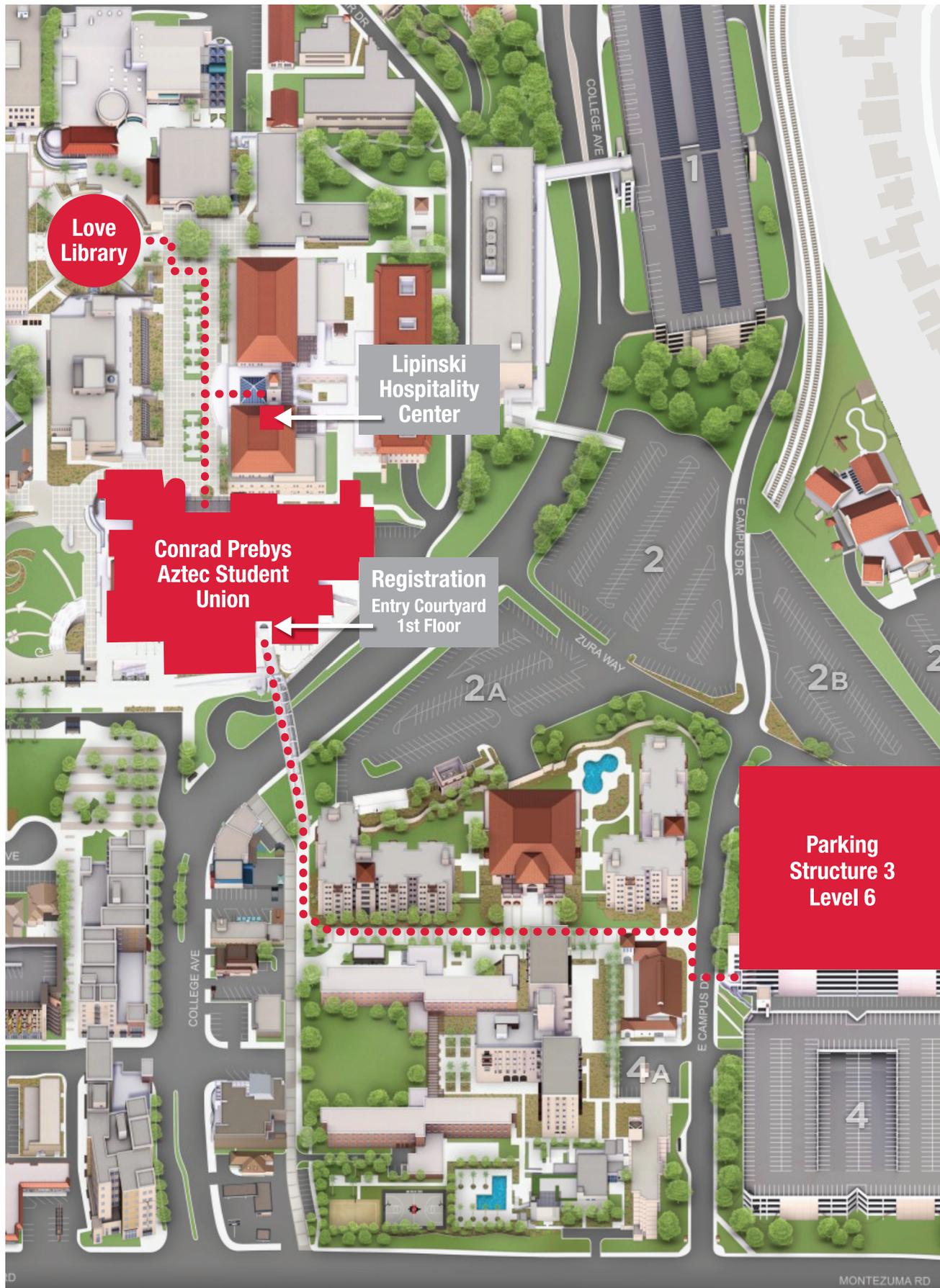
# **17th Annual SDSU Student Symposium**

## **March 1 and March 2, 2024**

A showcase of discovery,  
innovation and creativity

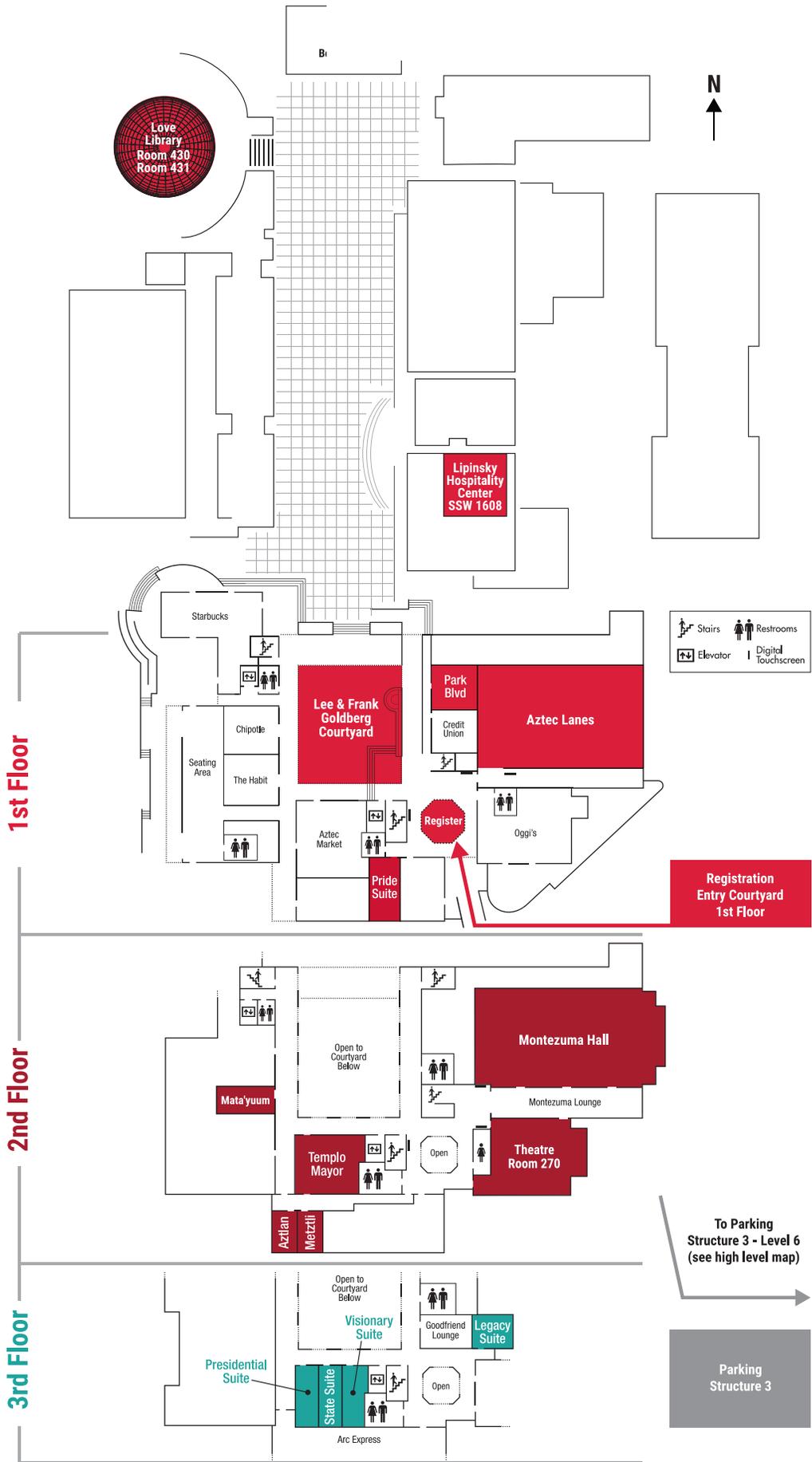
**SDSU** | San Diego State  
University

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Centennial Plaza and Walkway

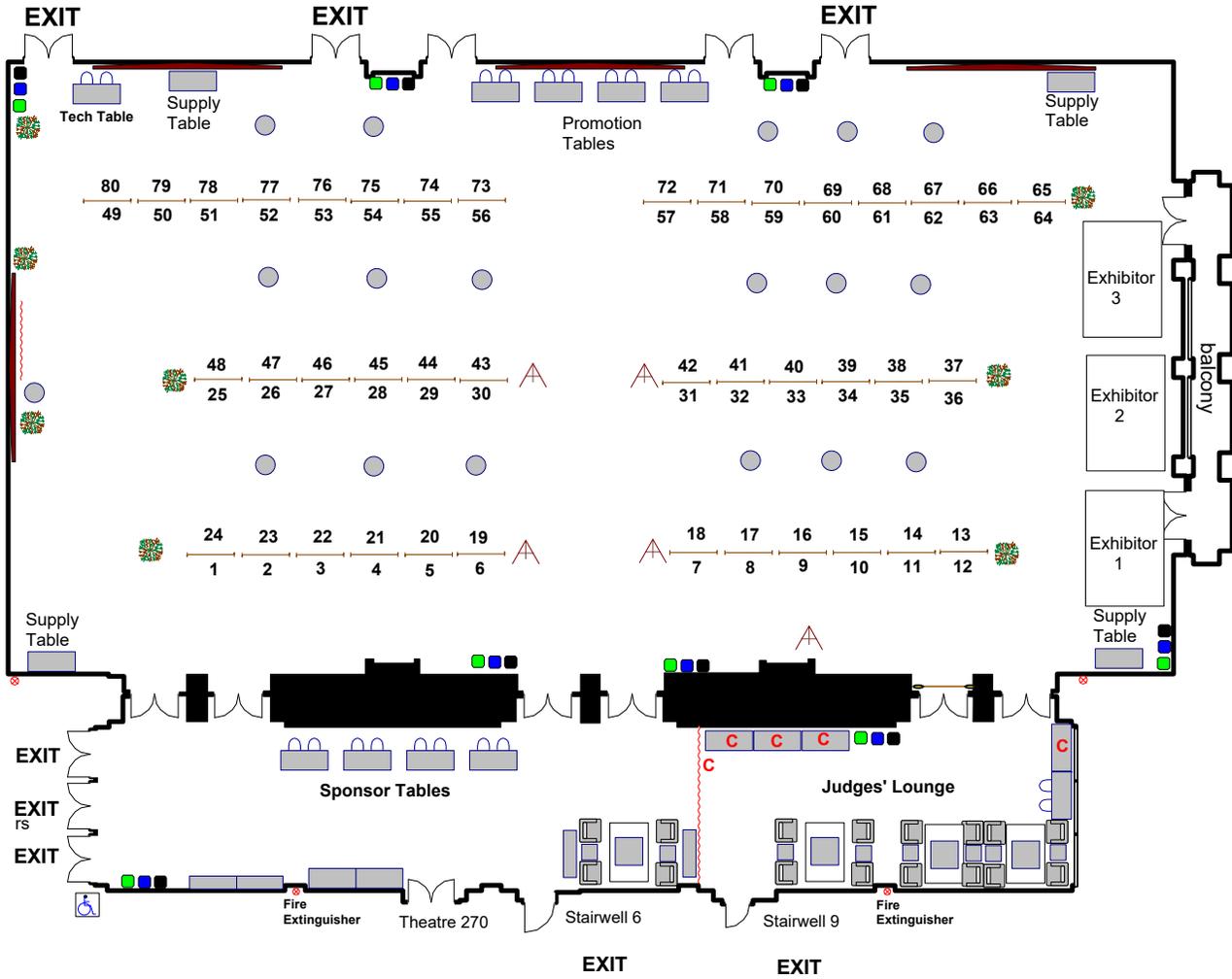
Conrad Prebys Aztec Student Union



CONRAD PREBYS AZTEC STUDENT UNION MAP

# Montezuma Hall and Montezuma Lounge Poster and Exhibitor Layout

EXHIBIT SCHEDULE AND EXHIBITOR LAYOUT



## We would like to thank our Sponsors

### Platinum Sponsors:

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**Adela de la Torre**

President  
San Diego State University

Dear colleagues and guests,

Welcome to the 17th SDSU Student Symposium (S<sup>3</sup>) at San Diego State University! SDSU is among the best public research universities, and this is an opportunity to showcase the scholarship, research, diversity and creativity that distinguish the institution and its students.

Over 500 undergraduate and graduate students from diverse backgrounds, experiences and interests, will present original creative and scholarly work representing the broad spectrum of research at SDSU. Through their insights, discoveries and performances, those in attendance from our university and our guests from the broader community will have the opportunity to celebrate the innovation and excellence that our students bring to the academic experience at SDSU.

S<sup>3</sup> aligns with our strong belief at SDSU that earning a degree is not an end, but a catalyst for rewarding careers. More than 70 of the students presenting at S<sup>3</sup> will receive awards for their field-specific impact and excellence, yet all will leave with valuable rewards from the experience. Whether enhancing their presentation skills and ability to articulate their understanding or expanding their networks and ability to work in teams, S<sup>3</sup> equips our students with tools to unlock bright futures.

I extend my gratitude to the students' mentors and to those from our local community who have volunteered their time as judges. Along with the many hours spent preparing for S<sup>3</sup>, more than 250 faculty, staff and volunteer experts are at the event giving freely of their time to evaluate oral presentations, exhibits and other research components. The dedication of SDSU's faculty and staff and synergistic partnership with the San Diego research ecosystem are keys driving the rapid growth of our research enterprise.

Thank you for joining us and for celebrating the amazing work of our incredible students!

Adela de la Torre, Ph.D.  
President  
San Diego State University

**Hala Madanat**

Vice President of Research and Innovation  
San Diego State University

Thank you for participating in the 2024 San Diego State University Student Symposium (S<sup>3</sup>)!

S<sup>3</sup> is an incredible venue for our students to present work they've spent the past year – and sometimes longer – developing. At SDSU, we want every student, across disciplines and experience levels, to have access to high-impact activities like research, scholarship and creative activities. We support students interested in participating in fieldwork, analyzing archival materials, learning bench science, creating new art, synthesizing literature with lived experiences, and much more. At S<sup>3</sup>, students have the opportunity to share their work with faculty, staff and our larger San Diego community, and to engage with their peers' extracurricular endeavors. This showcase is an excellent opportunity to exchange ideas and learn from one another, and that is why S<sup>3</sup> is one of my favorite events of the academic year!

Students: You are essential to the SDSU's rapidly growing research enterprise. Each year, thousands of you participate in discovery and creative innovation. You elevate our research, and your involvement makes us a stronger, more impactful institution. I hope your time spent preparing for and presenting at S<sup>3</sup> helps you grow as scholars, and allows you to identify paths that are both fulfilling and full of possibilities!

Behind each undergraduate and graduate student presenter is a team of faculty, staff, mentors, families, and friends. To each of these valuable supporters, thank you for shaping these students into scholars whose findings will undoubtedly heal communities, protect ecosystems, revolutionize industries and solve society's most pressing challenges.

And to the dedicated staff in our Division of Research and Innovation, thank you for the time and energy you devoted to organizing this phenomenal event. Our students would not be able to shine as brightly without you.

Hala Madanat, Ph.D.  
Vice President of Research and Innovation  
San Diego State University

**Erin P. Riley**

Professor of Anthropology

Assistant Dean of the College of Graduate Studies

Erin P. Riley is a Professor in the Department of Anthropology and the Assistant Dean in the College of Graduate Studies. Dr. Riley is a primatologist who integrates theory and methods from primatology, conservation ecology, and environmental anthropology to study primate behavioral flexibility in the face of rapid environmental change and the conservation implications of the ecological and cultural interconnections between humans and other primates. Since joining SDSU in 2006, Dr. Riley has mentored 10 master's students and eight undergraduate students in international field research in Indonesia and China. Dr. Riley's field research has been funded by the U.S. National Science Foundation, National Geographic Society/Waitt Foundation, the Wenner-Gren Foundation for Anthropological Research, the American Institute for Indonesian Studies, Primate Conservation, Inc, the American Society of Primatologists, ASIANetwork, and San Diego State University. She is currently the PI on a 3-yr NSF International Research Experiences for Students (IRES) grant that provides opportunities for SDSU undergraduate and graduate students to develop research, cross-cultural communication, and ethical fieldwork skills in Indonesia.



### Tierra Wilson

Recent graduate from the School of Art and Design  
Designed the S<sup>3</sup> 2025 artwork  
San Diego State University

Tierra Wilson is a December 2023 graduate from the School of Art and Design at San Diego State University. She loves graphic design because of its ability to create effective communication through creative visual elements. Her favorite fields of design are branding and marketing design. Born and raised in San Diego, CA, she has found a strong influence of contemporary and minimal vintage art in her work.

After consultation with student audiences and strategic communications staff, the S<sup>3</sup> committee selected Wilson's design from among seven designs created by students in the Design Studio course taught by Gary Benzel.

When creating the poster series and other design assets, Wilson wanted her designs to call out to individuals of all majors and disciplines. The ribbon illustration shown across all three posters is her interpretation of combining art and research. Wilson pulled inspiration from multiple disciplines by looking at images of sound waves, neuron synapses, and even analytics, which all created interesting patterns across a page. Rather than creating an exact illustration of these sources of inspiration, Wilson created the ribbon illustration.

In order to create more depth and dimension, the ribbon intertwines with each character, making the headline pop. Incorporated into the ribbon was a gradient of SDSU's brand colors in order to identify its affiliation to the school. The three core values of S<sup>3</sup> — discovery, creativity and innovation — are individually displayed on each poster. When placed together they can successfully work as a unit; alone they are still identifiable in relation to one another and to S<sup>3</sup>.



## Thursday, February 29, 2024

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Registration	1:00 pm – 4:00 pm	Aztec Student Union, Templo Mayor
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## Friday, March 1, 2024

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Registration	8:00 am – 4:00 pm	Aztec Student Union, Entry Courtyard
Continental Breakfast	8:00 am – 10:00 am	Aztec Student Union, Montezuma Lounge
Opening Remarks	8:30 am – 8:45 am	Aztec Student Union, Theatre
Snacks & Refreshments	11:30 am – 1:30 pm	Aztec Student Union, Montezuma Lounge
Volunteer Lunch	11:30 am – 1:30 pm	Aztec Student Union, Montezuma Lounge

## Saturday, March 2, 2024

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Three Minute Thesis	9:00 am – 10:00 am	Aztec Student Union, Theatre
Refreshments	10:00 am – 10:30 am	Aztec Student Union, Montezuma Lounge
Keynote & Awards Ceremony	10:30 am – 12:00 pm	Aztec Student Union, Theatre
Lunch Reception & Social	12:00 pm – 2:00 pm	Aztec Student Union, Aztec Lanes

Saturday events are open to all student presenters, mentors, judges, moderators, sponsors, and volunteers.

## Friday, March 1, 2004 - Sessions A-E

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	A-1	Oral	Behavioral and Social Sciences (U)	Legacy Suite
	A-2	Oral	Engineering and Computer Science (U)	State Suite
	A-3	Oral	Behavioral and Social Sciences 1 (G)	Love Library 430
	A-4	Oral	Behavioral and Social Sciences 2 (G)	Love Library 431
	A-5	Oral	Biological and Agricultural Sciences (G)	Pride Suite
	A-6	Oral	Engineering and Computer Science (G)	Metztli
	A-7	Oral	Humanities, History, Literature, Philosophy (G)	Aztlan
	A-8	Oral	Health Nutrition and Clinical Sciences (G)	Mata'yuum
	A-9	Oral	Engineering and Computer Science (U/G)	Visionary Suite
	A-10	Oral	Health Nutrition and Clinical Sciences (U/G)	Park Boulevard
11:00 am	B-1	Oral	Behavioral and Social Sciences 1 (U)	Love Library 430
	B-2	Oral	Behavioral and Social Sciences 2 (U)	Love Library 431
	B-3	Oral	Biological and Agricultural Sciences (U)	Legacy Suite
	B-4	Oral	Physical and Mathematical Sciences (U)	Visionary Suite
	B-5	Oral	Behavioral and Social Sciences (G)	Park Boulevard
	B-6	Oral	Biological and Agricultural Sciences (G)	Pride Suite
	B-7	Oral	Humanities, History, Literature, Philosophy (G)	Aztlan
	B-8	Oral	Physical and Mathematical Sciences (G)	Mata'yuum
	B-9	Oral	Biological and Agricultural Sciences (U/G)	State Suite
	B-10	Oral	Business Economics and Public Administration (U/G)	Metztli
1:00 pm	C-1	Oral	Behavioral and Social Sciences (U)	Love Library 430
	C-2	Oral	Biological and Agricultural Sciences (U)	Legacy Suite
	C-3	Oral	Humanities, History, Literature, Philosophy (U)	Visionary Suite
	C-4	Oral	Behavioral and Social Sciences (G)	Love Library 431
	C-5	Oral	Biological and Agricultural Sciences (G)	Park Boulevard
	C-6	Oral	Humanities, History, Literature, Philosophy (G)	Pride Suite
	C-7	Oral	Physical and Mathematical Sciences 1 (G)	Aztlan
	C-8	Oral	Physical and Mathematical Sciences 2 (G)	Mata'yuum
	C-9	Oral	Engineering and Computer Science (G)	Metztli
3:00 pm	D-1	Oral	Behavioral and Social Sciences (U)	Legacy Suite
	D-2	Oral	Behavioral and Social Sciences 1 (G)	Love Library 430
	D-3	Oral	Behavioral and Social Sciences 2 (G)	Love Library 431
	D-4	Oral	Visual and Creative Arts (G)	Aztlan
	D-5	Oral	Education (G)	Metztli
	D-6	Oral	Humanities, History, Literature, Philosophy (G)	Mata'yuum
	D-7	Oral	Humanities, History, Literature, Philosophy (U/G)	Visionary Suite
	D-8	Oral	Physical and Mathematical Sciences (U/G)	Legacy Suite
	D-9	Oral	Education (U/G)	Pride Suite
1:00 pm	E-1	Oral	Henrietta Goodwin Scholars Session 1 (U/G)	Templo Mayor
3:00 pm	E-2	Oral	Henrietta Goodwin Scholars Session 2 (U/G)	Templo Mayor

## Friday, March 1, 2024 - Sessions F-I

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	F-1	Poster	Behavioral and Social Sciences 1 (U)	Montezuma Hall
	F-2	Poster	Behavioral and Social Sciences 2 (U)	Montezuma Hall
	F-3	Poster	Biological and Agricultural Sciences (U)	Montezuma Hall
	F-4	Poster	Engineering and Computer Science 1 (U)	Montezuma Hall
	F-5	Poster	Engineering and Computer Science 2 (U)	Montezuma Hall
	F-6	Poster	Physical and Mathematical Sciences (U)	Montezuma Hall
	F-7	Poster	Health Nutrition and Clinical Sciences (U)	Montezuma Hall
	F-8	Poster	Behavioral and Social Sciences (G)	Montezuma Hall
	F-9	Poster	Biological and Agricultural Sciences (G)	Montezuma Hall
	F-10	Poster	Engineering and Computer Science (G)	Montezuma Hall
	F-11	Poster	Physical and Mathematical Sciences (G)	Montezuma Hall
11:00 am	G-1	Poster	Behavioral and Social Sciences 1 (U)	Montezuma Hall
	G-2	Poster	Behavioral and Social Sciences 2 (U)	Montezuma Hall
	G-3	Poster	Biological and Agricultural Sciences (U)	Montezuma Hall
	G-4	Poster	Engineering and Computer Science (U)	Montezuma Hall
	G-5	Poster	Physical and Mathematical Sciences (U)	Montezuma Hall
	G-6	Poster	Health Nutrition and Clinical Sciences 1 (U)	Montezuma Hall
	G-7	Poster	Health Nutrition and Clinical Sciences 2 (U)	Montezuma Hall
	G-8	Poster	Behavioral and Social Sciences (G)	Montezuma Hall
	G-9	Poster	Biological and Agricultural Sciences (G)	Montezuma Hall
	G-10	Poster	Engineering and Computer Science (G)	Montezuma Hall
	G-11	Poster	Physical and Mathematical Sciences (G)	Montezuma Hall
1:00 pm	H-1	Poster	Behavioral and Social Sciences 1 (U)	Montezuma Hall
	H-2	Poster	Behavioral and Social Sciences 2 (U)	Montezuma Hall
	H-3	Poster	Biological and Agricultural Sciences 1 (U)	Montezuma Hall
	H-4	Poster	Biological and Agricultural Sciences 2 (U)	Montezuma Hall
	H-5	Poster	Physical and Mathematical Sciences 1 (U)	Montezuma Hall
	H-6	Poster	Physical and Mathematical Sciences 2 (U)	Montezuma Hall
	H-7	Poster	Health Nutrition and Clinical Sciences (U)	Montezuma Hall
	H-8	Poster	Behavioral and Social Sciences (G)	Montezuma Hall
	H-9	Poster	Biological and Agricultural Sciences (G)	Montezuma Hall
	H-10	Poster	Engineering and Computer Science (G)	Montezuma Hall
	H-11	Poster	Health Nutrition and Clinical Sciences (G)	Montezuma Hall
3:00 pm	I-1	Poster	Behavioral and Social Sciences 1 (U)	Montezuma Hall
	I-2	Poster	Behavioral and Social Sciences 2 (U)	Montezuma Hall
	I-3	Poster	Biological and Agricultural Sciences (U)	Montezuma Hall
	I-4	Poster	Education (U)	Montezuma Hall
	I-5	Poster	Behavioral and Social Sciences (G)	Montezuma Hall
	I-6	Poster	Biological and Agricultural Sciences (G)	Montezuma Hall
	I-7	Poster	Health Nutrition and Clinical Sciences (G)	Montezuma Hall
	I-8	Poster	Education (G)	Montezuma Hall
	I-9	Poster	Business Economics and Public Administration (U/G)	Montezuma Hall
	I-10	Poster	Humanities, History, Literature, Philosophy (U/G)	Montezuma Hall
	I-11	Poster	Visual and Creative Arts (U/G)	Montezuma Hall

## Friday, March 1, 2024 - Sessions J, K

Time	Session Number	Session Type	Session Title	Presentation Location
11:00 am	J-1	Exhibit	Visual Arts 1 (U)	Montezuma Hall
3:00 pm	J-2	Exhibit	Visual Arts 2 (U/G)	Montezuma Hall
9:00 am	K-1	Performance/Film	Performance Arts 1 (U/G)	Theatre, Room 270
1:00 pm	K-2	Performance/Film	Performance Arts 2 (U/G)	Theatre, Room 270

## Closing Awards Ceremony 2024 Student Symposium

### Welcome

### Keynote Address

### Awards\*

HSI Award

Women in Engineering Awards

Sustainability Award

Charles Wei-Hsun Fu Foundation Philosophy Award

Arts Alive Award

Summer Undergraduate Research Program (SURP) Award

Arts Exhibit Award

Outstanding Creative and Performing Arts Award

Research Awards for Diversity, Inclusion, and Social Justice

Library Awards

Undergraduate Research Excellence Awards

Provost's Awards

Dean's Awards

President's Award for the Arts

President's Awards

\* Photos will be taken of each recipient as they receive the award. Group photos will be taken immediately after the ceremony. Recipients are encouraged to stay for group photos.

## Awards

Awards will be presented at the closing award ceremony on Saturday, March 2nd 2024 at 10:30am in Montezuma Theater, to recognize the most outstanding presentations in research, scholarship, and creative activities at the SDSU Student Symposium. The awards are as follows:

### President's Awards

Nine President's Awards of \$500 will be given to the most outstanding oral presentations across all disciplines. Those receiving a President's Award will represent SDSU at the California State University (CSU) Student Research Competition which will be held on campus at Cal Poly San Luis Obispo on April 26 and 27, 2024.

### President's Award for the Arts

One President's Award for the Arts of \$500 will be given to an outstanding presentation in the performance arts or exhibit category. The awardee will represent SDSU at the California State University (CSU) Student Research Competition, which will be held at Cal Poly San Luis Obispo on April 26 and 27, 2024.

### Dean's Awards

Sixteen Dean's Awards of \$250 will be given for oral or poster presentations. Awards will go to the top presentations in each college.

### Provost's Awards

Sixteen Provost's Awards of \$200 will be given for poster presentations. Awards will go to the top presentations in each college.

### Undergraduate Research Excellence Awards

Ten Undergraduate Research Excellence Awards of \$150 will be given for oral or poster presentations across all disciplines recognizing scholarly achievement.

### Library Awards

Five Library Awards of \$250 will be given for oral or poster presentations. Awards will go to the best projects using library resources and collections, including, but not limited to printed resources, databases, primary resources, and materials in all media.

### Research, Scholarship and Creative Activities Mentor Awards

Four Research, Scholarship and Creative Activities Mentor Awards of \$500 will be given to recognize excellence in student mentoring (2 undergraduate and 2 graduate awards).

### Research Awards for Diversity, Inclusion, and Social Justice Awards

Diversity, social justice, and inclusiveness reflect some of the values at the core of our university mission. Five \$250 awards will be given to the best oral or poster presentations that exemplify our ongoing commitment to diversity, inclusion, and social justice.

### Outstanding Creative and Performing Arts Award

One Outstanding Creative and Performing Arts Award of \$250 will be given.

### Arts Exhibit Award

One Arts Exhibit Award of \$250 will be given.

### **Summer Undergraduate Research Program (SURP) Awards**

Two \$250 awards will be given for oral or poster presentations by students who have participated in the SURP program.

### **Arts Alive Award**

The S<sup>3</sup> Arts Alive SDSU Award is offered to an outstanding student from any academic program who integrates the arts as part of an interdisciplinary research project that addresses cultural or sociopolitical issues. One award of \$250 will be given.

### **Charles Wei-Hsun Fu Foundation Philosophy Award**

The Charles Wei-Hsun Fu Foundation Philosophy Award is for students doing excellent research in the field of philosophy and encourages a special niche where philosophy students can shine. This award is open to all students who are engaged in philosophical research that are presenting an oral project at S3. One award of \$500 will be given.

### **Sustainability Award**

The Center for Regional Sustainability (CRS) fosters research; establishes collaborations across campus and with partners from business, government, and education; and generates solutions that enhance the natural environment, economic vitality, and social equity in the greater San Diego-Tijuana region. CRS sponsors the SDSU Student Research Symposium Sustainability Award to recognize student work that focuses on creating a more just, equitable, and sustainable world by integrating vital environmental, social, and economic needs of the present while ensuring future prosperity. One award of \$250 will be given.

### **Women in Engineering Awards**

The Women-in-Engineering (WIE) award has been presented during the SDSU's yearly S3 event since 2015. This award aims to promote women student engineers/ researchers from the College of Engineering at the undergraduate (BS) and graduate (MS/PhD) degree education levels. The first, second and third prize amounts are \$250, \$200 and \$150, respectively and will be awarded to the top three women engineers/researchers from the College of Engineering based on S3 oral/poster judging criteria. This award is sponsored by Dr. Satish Sharma, Director, Antenna and Microwave Lab (AML), Department of Electrical and Computer Engineering.

### **HSI Award**

The Office of HSI and Regional Affairs Student Research award goes to the top student whose research furthers our understanding of serving Latinx, Chicanx, or Hispanic students in higher education, or contributes to the commitment to honor our designation as an HSI. Two awards of \$250 will be given.

**\*Please note** – Students receiving one award will not be considered for additional awards.



CALIFORNIA STATE UNIVERSITY  
**GRAD SLAM**  
THREE-MINUTE THESIS COMPETITION  
**MAY 3, 2024**



HOSTED BY:  
CALIFORNIA STATE UNIVERSITY  
**LONG BEACH**

### Three Minute Thesis

For this year's SDSU Student Symposium, we will be holding a "three-minute thesis" competition that will provide an opportunity for SDSU graduate students to showcase their research, scholarship, or other creative work on Saturday, March 2nd from 9 AM to 10 AM in Theatre at the Conrad Prebys Aztec Student Union.

During the competition, graduate students will be judged by a panel based on their ability to successfully engage a non-specialist audience while communicating key details about their research, scholarship, or other creative work in three minutes or less with just a single PowerPoint slide.

The top two presenters will receive a monetary prize (First Prize \$500; Second Prize \$250) and will compete in the [CSU Grad Slam](#) Competition (virtual) hosted by California State University Long Beach.



## Oral Presentations

Friday, March 1, 2024

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Sessions A-E

Each oral presentation is allotted 10 minutes followed by a 5-minute question and answer period. Participants and guests are asked to enter or leave the rooms only between presentations.

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University

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Friday, March 1, 2024

### Session A: Oral Presentations

#### Session A-1

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Behavioral and Social Sciences

**Friday, March 1, 2024 9:00 am**

Legacy Suite

**100 9:05 am**

No Academia without AI: Decoding College Student's Perceptions of Artificial Intelligence

**Emily Mooney, Bachelor of Arts in Communication (U)****101 9:25 am**

Suicide Risk Factors and Types of Intersectional Discrimination Among Sexual and Gender Minority Youth at Risk for Repeat Suicide Attempts

**Shefali Sharma, Bachelors of Arts in Psychology with an Emphasis in Neuroscience (U)****102 9:45 am**

Fear Mapping

**Emily Brown, Bachelor of Science in Environmental Engineering (U)****103 10:05 am**

Sustainability as a tool for slum mitigation in the Indian subcontinent, Latin America, and Sub-Saharan Africa

**Alisson Ruballo Jimenez, Bachelor/International Security and Conflict Resolution (U)****104 10:25 am**

The unique effect of neglect on trajectories of speech problems in youth

**David Straub, Post-bac (U)****105 10:45 am**

Does ChatGPT Write Reviews that are Human-Like, Trustworthy, and Convincing, According to Readers?

**Emily McHale, Linguistics and Spanish (SST) (U)**

#### Session A-2

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Engineering and Computer Science

**Friday, March 1, 2024 9:00 am**

State Suite

**106 9:05 am**

Quantum Algorithm for Resolving the Prisoner's Dilemma via Nash Equilibrium

**Tanner Kocher, Bachelor of Science in Computer Science (U)****107 9:25 am**

Analysis and Interpretation of VLA RFI Monitoring Data From the SpaceX Pilot Installation

**Erik Chavarin, Bachelor of Science in Electrical Engineering (U)****108 9:45 am**

Investigating the Environmental Fate of Marine Debris: Insights from Outdoor Exposure Experiments and Tumbling Simulations

**Alexi Olney, Bachelor of Science in Statistics with an emphasis in Data Science, Minor in Environmental Engineering (U)****109 10:05 am**

Utilization of fluorescence spectroscopy to track startup of plastic and rock media upflow bioreactors for anammox enrichment

**Polina Popova, Bachelors of Science in Environmental Engineering (U)****110 10:25 am**

Tensile Behavior of Density-graded Polyurea Elastomeric Foams

**Paul Kavvaka, Mechanical Engineering (U)**

#### Session A-3

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Behavioral and Social Sciences 1

**Friday, March 1, 2024 9:00 am**

Love Library 430

**111 9:05 am**

The construction of ideology in U.S. news reports: An exploration through grammar choices

**Samuel Massey, Masters of Arts in Linguistics (M)****112 9:25 am**

Deutsch or Mexicana: German Investment and Identity in Mexico during the Porfiriato

**Arturo Avalos, Masters of Arts in Anthropology (M)**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

### 113 9:45 am

Cognitive control dysregulation in young adult binge drinkers: behavioral indices and oscillatory neurodynamics

**Vanessa Thomas, Psychology (M)**

### 114 10:05 am

Exploring ethnic identification's impact on Gen-Z Asian American beauty influencer marketing campaigns

**Jessica Arguelles, Mass Communications/MA (M)**

### 115 10:25 am

Identifying key strategies for program sustainment in faith-based settings through promotora perspectives

**Melanie Gomez, Masters of Arts in Psychology (M)**

### 116 10:45 am

Testing the feasibility of a prenatal yoga mobile app in African American pregnant women: The Mindful Maternity Study

**Destiny Akins, MS Nutritional Sciences (M)**

## Session A-4

Behavioral and Social Sciences 2

**Friday, March 1, 2024 9:00 am**

Love Library 431

### 117 9:05 am

Exploring Multilevel Factors that Influence Physical Activity Among Latinos with Chronic Spine Pain

**Patricia Dionicio, Doctorate in Public Health - Health Behavior (D)**

### 118 9:25 am

Bridging Gaps in Physical Activity Promotion: Adapting Faith in Action for Rural Latinas Using the IM-Adapt Framework

**Jackelyne Garcia, Doctorate in Clinical Psychology (D)**

### 120 10:05 am

Exploring Coparenting Strain and Outcomes

**Nicolé Mendoza, Masters of Arts in Sociology (M)**

### 121 10:25 am

Puff Break: Protocol for Adapting Ecological Momentary Assessment Methods to Measure Factors Associated with Tobacco, Nicotine, and Cannabis Use among LGBTQ+ Adolescents in California

**Andrew Lim, Joint Doctoral Program in Public Health - Health Behavior Concentration (D)**

### 122 10:45 am

Intersectional Disparities in Breast Cancer Screening Mammographies in racial and gender minorities in the US before and during the COVID-19 pandemic

**Sara Liaquat, Masters of Arts in Sociology (M)**

## Session A-5

Biological and Agricultural Sciences

**Friday, March 1, 2024 9:00 am**

Pride Suite

### 123 9:05 am

Alphaproteobacteria lipopolysaccharide stimulates animal metamorphosis

**Morgan Farrell, PhD/ Cell and Molecular Biology (D)**

### 124 9:25 am

The Role of Nuclear Factor  $\kappa$ B-inducing Kinase (NIK) in Supporting Ovarian Cancer Stem-Like Cells

**Cassidy Lucht, Master's in Cell and Molecular Biology (M)**

### 125 9:45 am

Prickly Challenge to the Dead End Hypothesis from Native Cactus *Cylindropuntia*

**Niveditha Ramadoss, PhD in Evolutionary Biology (D)**

### 126 10:05 am

Evidence of Inbreeding and Low Genetic Diversity of a Rare Cactus (*Ferocactus gatesii*) in Baja California

**Yazmín Lommel, Evolutionary Biology/Master's of Science in Biology (M)**

### 127 10:25 am

Effects of ruminant bromoform supplementation on manure wastewater treatment

**Tommie Post, M.S. Civil Engineering (Environmental Engineering) (M)**

### 128 10:45 am

Phenological variation and evolution across space and time in Scarlet Monkeyflowers

**Jordan Waits, Masters of Science in Evolutionary Biology (M)**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Session A-6

Engineering and Computer Science

Friday, March 1, 2024 9:00 am

Metztli

### 129 9:05 am

Can Bio-Analyte Detection Be Enhanced Through Optimization of Glassy Carbon Functionalization Techniques and Implementation of Field Effect Transistors?

Sara Herrera, Master of Science in Bioengineering (M)

### 130 9:25 am

Ultra low-power, wearable, accelerated shallow-learning fall detection for elderly at-risk persons

Tian Jingxiao, Phd in Electrical and Computer Engineering (D)

### 131 9:45 am

Multi-faceted Mechanics Analysis of Novel Auxetic Meta-structures

Celia Rufo Martin, Ph.D. degree in Mechanical Engineering (D)

### 132 10:05 am

A Wideband Hemispherical Metasurface (MTS) Antenna with Circular Fractal Elements for 6G Communications

Somayeh Komeylian, PhD Electrical and Computer Engineering (D)

### 133 10:25 am

A Novel Approach in Diabetes Management: The Development and Clinical Implications of a MEMS Cuff Electrode for Vagus Nerve Stimulation

Ahmad Abushanab, Bioengineering (M)

### 134 10:45 am

Marine Debris from River Margins: Wet and Dry Weathering Effects on the Fragmentation and Degradation of Discarded Plastic

Ella Knight, Masters of Science in Environmental Engineering (M)

## Session A-7

Humanities, History, Literature, Philosophy

Friday, March 1, 2024 9:00 am

Aztlan

### 135 9:05 am

“Bordering on Parasocial”: Personhood and Parasocial Relationships in VTubing

Micah Sakado, Anthropology (M)

### 136 9:25 am

Unveiling the Impact of Gloria Calderon Kellet

Anissa Zuniga, Masters of Arts in History (M)

### 137 9:45 am

The hypocrisy of the homo economicus. surveillance capitalism and the law of profit

Chiara Malvestiti, MA Philosophy (M)

### 138 10:05 am

Escaping the Confinement of the Self Through Art: Existential Anxiety, Authenticity, and Encountering the Aesthetic in the Quotidian, or How to Live a Thoughtful Life

Carla Marian Cuevas Morales, Master of Arts in Liberal Arts and Sciences (M)

### 139 10:25 am

Effects of Ancient Texts on Modern Attitudes: Comparing Traditional Western and Asian Animal Imagery and Contemporary Motivations for Vegetarianism

Matthew Brown, Masters of Arts in Philosophy (M)

### 140 10:45 am

Emnity to Affinity and Beyond: Filipino Eternal Indebtedness

Rustico Rasing, Masters of Arts in History (M)

## Session A-8

Health Nutrition and Clinical Sciences

Friday, March 1, 2024 9:00 am

Mata'yuum

### 141 9:05 am

Bridging the Gaps within Concussion Education: A Preliminary Analysis into Proposed Improvements from Student-Athletes

Madeline Strom, Master of Science in Athletic Training (M)

### 142 9:25 am

Association Between Latino Parent and Child Total Physical Activity and Sedentary Behavior

Savannah Shifflett, Master of Science in Epidemiology (M)

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**143 9:45 am**

Navigating Cultural and Collaborative Dietary Strategies: An Ethnographic Approach to Understanding Dietary Behavior in Oaxaca, Mexico  
Lucia Canul, JDP in Global Health (D)

**144 10:05 am**

Hearing Loss in US/Mexico Border Farmworkers  
Christen Rodriguez, Doctor of Audiology (Au.D.) (D)

**145 10:25 am**

Body composition and incidence of obesity-related cancers among adults in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)  
Pragnya Wanjerkhede, MS in Epidemiology (M)

**146 10:45 am**

Unlocking Seafood Flavors from Macroalgae: A Sustainable, Vegan Approach  
Jesse Baker, Masters of Nutritional Science & DPD program (M)

**Session A-9**

Engineering and Computer Science

**Friday, March 1, 2024 9:00 am**

Visionary Suite

**147 9:05 am**

SoFIE Flow Duct Sensor Calibration associated with Development of new N.A.S.A. Materials Combustibility Standards for Flight Material Choices  
Jack Volponi, Mechanical Engineering (U)

**148 9:25 am**

3-D Flow Visualization of Vortex Rings in the Left Ventricle  
Britton Mennie, Biomechanical engineering (U)

**149 9:45 am**

Three-Dimensional Flow Studies of the Aortic Root During Mechanical Circulatory Support  
Hailey Harkness, Masters of Science in Bioengineering (M)

**150 10:05 am**

Analysis of graphene derived via photolithographically-patterned C-MEMS and incorporation into implantable bioelectronic devices  
Pourya Bayzaie, Master of Science in Bioengineering (M)

**151 10:25 am**

Simulations of Acoustic Instability in a Pintle Injector Rocket Engine  
Thomas Ridgeway, Master of Science in Aerospace Engineering (M)

**152 10:45 am**

Spatiotemporal Analysis and Deep Learning Image Classification with Google Street View (GSV) of the Homelessness Problem  
Shravani Hariprasad, Master of Science in Big Data Analytics (M)

**Session A-10**

Health Nutrition and Clinical Sciences

**Friday, March 1, 2024 9:00 am**

Park Boulevard

**153 9:05 am**

Identification of Flavor Active Compounds in Micro- and Macro- Algae  
Ellie Cramton, Bachelors of Foods and Nutrition (U)

**154 9:25 am**

Better Space Parties with Algae-Enriched Guacamole  
Rebecca Vernazza, Foods and Nutrition (U)

**155 9:45 am**

Is Health Literacy Associated with Concussion Care Seeking Intentions and Behavior in Collegiate Students?  
Julia Ng, Bachelors of Science in Kinesiology, Pre-Physical Therapy (U)

**156 10:05 am**

Kinematics associated with patellar tendinopathy in collegiate basketball athletes  
Sarah Konig, Kinesiology Pre- Physical Therapy (U)

**157 10:25 am**

Asymmetry between non-dominant and dominant limbs in female collegiate lacrosse athletes during a drop vertical jump  
Jade Jachim, Interdisciplinary Studies in Three Departments (Biology, Chemistry, Psychology) + Public Health minor (U)

**158 10:45 am**

Obesity and Socioeconomic Influences: A Geographic Analysis of the Hispanic Population in Los Angeles, California  
Salma Iraqi, MPH in Epidemiology and Biostatistics (M)

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## Friday, March 1, 2024

### Session B: Oral Presentations

#### Session B-1

Behavioral and Social Sciences 1

**Friday, March 1, 2024 11:00 am**

Love Library 430

**159 11:05 am**

Rejoicing, Rewarding, and Rejecting: An Investigation of Affection in Intimate College-Aged Relationships  
 Isabel Villegas-Glang, Bachelor of Arts in Communication (U)

**160 11:25 am**

Authoritarianism in the EU integration process  
 Gianni Louis Fungipani, Undeclared (U)

**161 11:45 am**

Why Does Gender Matter? Student Perspectives on Leadership  
 Sydney Stafford, Bachelor of Arts in Communication (U)

**162 12:05 pm**

Fighting for Gaza: Assessing student mobilization movements and shifting foreign policy perspectives  
 Allison Gallant, Bachelor Political Science (U)

**163 12:25 pm**

Exploration of the Slavic Impact on Romanian Language Change  
 Devi Garnerero, Language Culture and Society major and Italian minor (U)

#### Session B-2

Behavioral and Social Sciences 2

**Friday, March 1, 2024 11:00 am**

Love Library 431

**164 11:05 am**

Complications of Brexit: The Troubles and Northern Ireland's Identity Politics  
 Samantha DiDomenico, Bachelor of Arts in political science (U)

**165 11:25 am**

The Interconnectedness of Love and Guilt: Discovering the Path to Conocimiento and Healing by Confronting Guilt with Love  
 Jenae Dellafosse, Bachelor of Arts in Sociology (U)

**167 12:05 pm**

Land Access, Gentrification, and Urban Agriculture In San Diego  
 Tyana Ortiz, Environmental Science (U)

**168 12:25 pm**

Cheek pouch use of *Macaca maura* in proximity to road in Bantimurung Bulusaraung National Park, Sulawesi, Indonesia  
 Emily Rapp, Environmental Sciences B.S. (U)

#### Session B-3

Biological and Agricultural Sciences

**Friday, March 1, 2024 11:00 am**

Legacy Suite

**169 11:05 am**

Aerobic Activity is Impaired by Vaping  
 Sama Mikhail, Bachelor of Science in Microbiology (U)

**170 11:25 am**

Determining Cloning in Native Succulent Population  
 Camille Movafagian, Bachelor of Science in Biology (U)

**171 11:45 am**

Accurate growth kinetics and biochemical composition characterization enable smart cultivation of nutritious marine *Dunaliella salina* biomass to enhance space food  
 Shaila Prasad, Bachelors of Science in Microbiology with emphasis in CLS and minor in Chemistry (U)

**172 12:05 pm**

Identification and functional analysis of ABC transporters in the planarian *Schmidtea mediterranea*  
 Rania Atto, Bachelor in Microbiology (U)

**173 12:25 pm**

Stem Cell and Gene Therapy for Friedreich's Ataxia  
 Angelyn Solis, Bachelor of Sciences in Biology (U)

#### Session B-4

Physical and Mathematical Sciences 1

**Friday, March 1, 2024 11:00 am**

Visionary Suite

**174 11:05 am**

Developing a Long-Range Optical Oil Spill Detector Using Fluorescence  
 Faith Poutoa, Physics (U)

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### 175 11:25 am

Plasmonics and hBN

Jennifer Brumley, Bachelors of Science/Physics (U)

### 176 11:45 am

Plastic Wastes Upcycling via Electrocatalytic C-N Coupling Reaction

Melanie Weed, Bachelor of Science in Chemistry (U)

### 177 12:05 pm

An ab initio investigation of the energetic properties of HC3O radicals

Molly Hedin, Biochemistry (U)

## Session B-5

Behavioral and Social Sciences

Friday, March 1, 2024 11:00 am

Park Boulevard

### 178 11:05 am

Caregiver Conflict, Screen Time, and Childcare Challenges: Unraveling The Effects of the Pandemic on Children's Vocabulary

Matthew McArthur, Masters of Arts in Psychology (M)

### 179 11:25 am

From Enumeration to Empowerment: Visualizing and quantifying access to sanitation resources among San Diegans experiencing homelessness

Adriana Rios, M.A in Psychology (M)

### 180 11:45 am

Seed-handling behaviors of the endangered moor macaque (*Macaca maura*) in Sulawesi, Indonesia

Elena Williams-Moreiras, Masters of Arts in Anthropology (M)

### 181 12:05 pm

Where Are They Now? Reflections of Former Diverted Youth

Anna Disser, Master of Social Work (M)

### 182 12:25 pm

Facilitating picture naming in people with aphasia: Not all semantic cues are created equal

Preeti Rishi, PhD in Language And Communicative Disorders (D)

### 183 12:45 pm

Student Leadership: Institutional Agents at Hispanic Serving Institutions

Griselda Paredes, Ph.D. in Education with CGU & SDSU (D)

## Session B-6

Biological and Agricultural Sciences

Friday, March 1, 2024 11:00 am

Pride Suite

### 184 11:05 am

Developing Animal Borne Accelerometry Tools to Quantify the Movement and Behavior of *Crotalus ruber* within the Coastal Sage Scrub

Emma McAndrews, Ecology (M)

### 185 11:25 am

The Collective Movement Behavior of Sulawesi Moor Macaques (*Macaca maura*) in an Anthropogenic Environment

Trinidad Joshua, Masters of Arts in Anthropology (M)

### 186 11:45 am

Assessing the metabolic impact of toxoplasmosis correlating to immune response, parasite burden and the microbiome

Caitlyn Middleton, Doctor of Philosophy in Biochemistry (D)

### 187 12:05 pm

In-depth Exploration: Purification and Kinetic Study of WT and Mutant Human DNA Polymerase  $\epsilon$

Ashfeen Nawar, MS in Chemistry (M)

### 188 12:25 pm

"What's My Age Again ?": Masculinity in blink-182's Pop-Punk

Maximus Miesner, Masters of Arts in History (M)

### 189 12:45 pm

Investigating the Biogeographic Barriers on the genetic landscape of *Eucalyptus moluccana*

Rosalinda Diaz, Bioinformatics (M)

## Session B-7

Humanities, History, Literature, Philosophy

Friday, March 1, 2024 11:00 am

Aztlan

### 190 11:05 am

To Make a Better World: Black Canadian Women's Transnational Activism in Print, 1986-1989

Kayla Daniels, Masters of Arts in History (M)

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**191 11:25 am**

Exile and Language: A Personal Appreciation of the Romanian Writer Norman Manea

Anca Segall, MFA / English (Creative Writing) (M)

**192 11:45 am**

Dolores Huerta: Embodying Change

Briana Betschart, Masters of Art in History (M)

**193 12:05 pm**

Sontag in Sarajevo: Regarding the Age of Mass-Mediated Atrocity

Sara Romano, Masters of Arts in Liberal Arts and Sciences (M)

**194 12:25 pm**

Illicit People vs. Illicit Acts: Vagrancy as a Social Constraint in Early American San Diego

Thomas Pugh, Masters of Arts in History (M)

**195 12:45 pm**

The Aesthetics of Skateboarding

Hector Quintero, Masters of Arts in Philosophy (M)

**Session B-8**

Physical and Mathematical Sciences

Friday, March 1, 2024 11:00 am

Mata'yuum

**196 11:05 am**

Gravitational Waveforms of EMRI's with Eccentricity and Supermassive Black Hole Spin

Joshua Bardwell, Master's/Astronomy (M)

**197 11:25 am**

Limits on Circumbinary Planet Habitable Zones

Vladimir Bautista, M.S. in Astronomy (M)

**198 11:45 am**

Prediction of Delisting using a Machine Learning Ensemble

David Neuhaeusler, Master of Science in Statistics (M)

**199 12:05 pm**

Light Travel

Alekhya Nagulapally Alekhya, Master's of Science in Physics (M)

**201 12:45 pm**

A Search for Circumbinary Planets in Kepler Short-Period Binary Star Light Curves

Margo Thornton, Masters of Science in Astronomy (M)

**Session B-9**

Biological and Agricultural Sciences

Friday, March 1, 2024 11:00 am

State Suite

**202 11:05 am**

Quantifying structural differences between diverse species sperm midpiece segments using electron microscopy

Alexander Price, Bachelor/Mechanical Engineering (U)

**203 11:25 am**

Investigating Neoteny in Human vs Non-human Primate Derived Forebrain Organoids

Joshua Pratt, Bachelor of Science in Biology (U)

**204 11:45 am**

Tri-trophic interaction: Two fungus and a pine tree

Karina Cerda, PhD (D)

**205 12:05 pm**

Predictors of cattle milk productivity in Rondônia, Brazil

Elise Piazza, Master of Science in Geography (M)

**Session B-10**

Business Economics and Public Administration

Friday, March 1, 2024 11:00 am

Metztli

**206 11:05 am**

Mujeres en Lucha: Leadership and Political Participation of Indigenous Women Addressing Gendered Violence in Oaxaca, Mexico

Jazmin Luna, MA Public Administration & MA Latin American Studies (M)

**207 11:25 am**

Buying was so last season: persuasive effects of deinfluencers versus influencers on purchase intentions

Allison Gennette, M.A. Mass Communication and Media Studies (M)

**208 11:45 am**

The Unheard Outcry: Feelings of Safety and Connectedness of Latinx, 2SLGBTQ+, and 2SLGBTQ+ Latinx Middle and High School Students in San Diego County Schools

Carlos Carlos Pineda, Masters program in Dual Language Education and Critical Literacy (M)

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### 209 12:05 pm

Predicting Crime Resolution in Los Angeles  
Anurima Saha, **Big Data Analytics (M)**

### 210 12:25 pm

The Economic and Ecological Impacts of Forest Management Reform: Evidence from the Forest Law Enforcement Governance and Trade Program  
Hattie Jenkins, **Bachelor of Science in Statistics, Bachelor of Liberal Arts Economics emphasis in Public Policy, Minor in Interdisciplinary Studies (U)**

### 211 12:45 pm

Exploring Employment: A Personalized Empirical Analysis of Application Tactics  
Talia Finburgh, **Bachelor's of Science in Business Administration: General Business (U)**

## Friday, March 1, 2024

### Session C: Oral Presentations

#### Session C-1

Behavioral and Social Sciences  
Friday, March 1, 2024 1:00 pm  
Love Library 430

### 212 1:05 pm

Improving Continuity and Scale: Introducing the Spanish Web-Based Computerized Comprehension Task  
Diego Leon, **Bachelor of Arts in Psychology (U)**

### 213 1:25 pm

Land Reform and Conflict: A Case Study of Colombia  
Max Moore, **Bachelor of Arts in International Security and Conflict Resolution (U)**

### 214 1:45 pm

How does the fentanyl epidemic affect college students in the United States  
Malachi Lee, **Criminal justice (U)**

### 215 2:05 pm

Exploring multispecies associations among moor macaques, birds, and cows in Sulawesi, Indonesia  
Matthew Hall, **Bachelor of Arts in Anthropology (U)**

### 216 2:25 pm

Liberating the Spirit: Queer Inclusion in African Diaspora Religions  
Tiffany Hungerford, **Africana Studies, B.A. in Liberal Arts and Sciences (U)**

#### Session C-2

Biological and Agricultural Sciences  
Friday, March 1, 2024 1:00 pm  
Legacy Suite

### 217 1:05 pm

Exploring flavors of edible ants: A path to sustainable gastronomy and consumer acceptance  
Selene Alvarado Martinez, **Bachelor of Science in Foods and Nutrition (U)**

### 218 1:25 pm

Advancing Escher Web Tools for Dynamic Genome-Scale Metabolic Model Visualization  
Julio Nunez Garcia, **Computer Science (U)**

### 219 1:45 pm

R132Q IDH1 sensitivity to reducing agents  
Nicole Sierra, **Biochemistry/Bachelor (U)**

### 220 2:05 pm

Herbivore-Induced Plant Volatiles Mediate Belowground Tritrophic Interactions  
Scott Monahan, **Bachelor of Science in Biology (U)**

### 221 2:25 pm

Investigating the role of immune and developmental genes during bacterial-stimulated metamorphosis in the marine tubeworm *Hydroides elegans*  
Tatyana Ali, **Biology/ Bachelor of Science (U)**

### 222 2:45 pm

Identification of novel proteins that directly control TDP-43 Mislocalization in ALS  
Chloe Ferguson, **Bachelor of Science in Biology (U)**

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## Session C-3

Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 1:00 pm**

Visionary Suite

### 223 1:05 pm

Stories of Foster Children: Issues of Identity, Liminality, and Struggle (Mid-20th Century New York City)

Joseph Wiese, Triple Major: History, Sociology, Social Work (U)

### 224 1:25 pm

Understanding the Elliptical Nature of Gender Discrimination, Sports, and Media: A Communication-Oriented State of the Literature

Alexander Tran, Communication Studies (U)

### 225 1:45 pm

Making Art Museums More Accessible: The Laguna Art Museum, A Case Study

Crystal Choi, Bachelor of Art with an Emphasis in Art History (U)

### 226 2:05 pm

An Exploration of the Incel

Joel Varon, Philosophy (U)

### 227 2:25 pm

Book Talk: My Brilliant Friend

Sabine Ruiz, Liberal Studies Elementary Education (U)

### 228 2:45 pm

“Aloha ‘Oe”: The Music of Queen Lili‘uokalani as Cultural Preservation and Protest

Melia Miner, Bachelor of Science in Mechanical Engineering (U)

## Session C-4

Behavioral and Social Sciences

**Friday, March 1, 2024 1:00 pm**

Love Library 431

### 229 1:05 pm

Towards Transformative Justice: Envisioning Survivor-Centric Approaches Beyond Title IX for Addressing Campus Sexualized Violence at San Diego State University

Vale Magana, Masters of Arts in Women's Studies (M)

### 230 1:25 pm

Exploring Student-to-Student Confirmation, Communication Apprehension, and Academic Self-Efficacy in (Post) Carceral Education

Annika Wong, Masters of Arts in Communication Studies (M)

### 231 1:45 pm

Exploring how Trust and Social Support Shape Housing-Insecure Youth's Health-Related Experiences During COVID-19

Hannah Reynolds, Masters of Public Health (M)

### 232 2:05 pm

Exploring the Knowledge and Attitudes of Emerging Health and Human Service Professionals Regarding Sexuality and Older Adults

Jocelyn Smith, Master of Social Work & Master of Public Health with a concentration in Health Management and Policy Major (M)

### 233 2:25 pm

When words collide: Impact of top-down and bottom-up input during bilingual picture-word matching

Laura Fitzgerald, Master of Arts in Linguistics (M)

### 234 2:45 pm

Exploring Graduate TAs' Perspectives on Equity in Professional Development

Matthew Taylor, PhD Math and Science Education (D)

## Session C-5

Biological and Agricultural Sciences

**Friday, March 1, 2024 1:00 pm**

Park Boulevard

### 235 1:05 pm

Tests of Ghost Introgression into Extant Lineages

Wanjiku Wanjiku, PhD in Evolutionary Biology (D)

### 236 1:25 pm

The Role of the Drosophila Muscle Gene CG42319 in Muscle Development and Function

Ebru Robinson, Cell and Molecular Biology (M)

### 237 1:45 pm

The TWEAK-Fn14-NF- $\kappa$ B signaling axis enhances expression of integrin  $\alpha$ V $\beta$ 3 in a post-chemotherapy tumor microenvironment

Omar Lujano Olazaba, JDP PhD Biology (D)

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### 238 2:05 pm

Enhanced expression of the myogenic factor Myocyte enhancer factor-2 in imaginal disc myoblasts activates a partial, but incomplete, muscle development program

Elizabeth Trujillo, PhD/PhD Cell and Molecular Biology (D)

### 239 2:25 pm

Resilient Restoration: Drought Resilience Amongst Southern California Coast Live Oak Populations on Tribal Lands

Alexandra Hoff, Masters of Science in Biology (M)

### 240 2:45 pm

The generation of an engineered HEK293T cell line bearing mutant NEMO incapable of binding to secondary binding site

Sally Luong, Doctor of Philosophy in Chemistry (D)

## Session C-6

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Humanities, History, Literature, Philosophy

Friday, March 1, 2024 1:00 pm

Pride Suite

### 241 1:05 pm

The State of Affairs Surrounding Intersex Genital Mutilation & Gender Affirming Services in Karachi, Pakistan

Sara Liaquat, Masters of Arts in Sociology (M)

### 242 1:25 pm

A Postmodern SMiLE

Andrew Ginzler, Critical Studies in Music (M)

### 243 1:45 pm

The Shining Nights of High Summer: Affect in the Composition and Performance of Art Song

Nathan Villamor, Master of Music in Vocal Performance (M)

### 244 2:05 pm

Voices in Harmony: Exploring Parental Dialectal Variations and First-Generation Children's Language Development in Multicultural Contexts

Yassin ALHENNAWY, General Linguistics /Masters of Arts (M)

### 245 2:25 pm

Representation of Mexican protests and protesters against attacks on women: a CDA and transitivity analysis to uncover ideology conveyed by news outlets

Ana Sofia Ana Sofia Montes Aguila, Applied Linguistics (M)

### 246 2:45 pm

Melodrama Meltdown: How National Tensions over Legal Slavery Influenced the Characterization of Law and Justice in 1800s Melodrama

Robyn Wilkinson, Masters of Arts in Theatre Arts (M)

## Session C-7

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Physical and Mathematical Sciences 1

Friday, March 1, 2024 1:00 pm

Aztlan

### 247 1:05 pm

Exploring Defects and Isotopes effects Through Raman Signal in Hexagonal Boron Nitride

Sancia Michael Tauro, Masters of Science in Physics (M)

### 248 1:25 pm

Exploring an Amalgam of Period Finding Techniques

Samantha Anger, Master's of Science in Astronomy (M)

### 249 1:45 pm

A Search for Additional Planets in Kepler-16 and Kepler-34

Patricia Spalding, Master of Science in Astronomy (M)

### 250 2:05 pm

Influences of Tree Mortality on Fire Intensity and Burn Severity for a Southern California Forest Using Airborne and Satellite Imagery

Nowshin Nawar, Geography (M)

## Session C-8

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Physical and Mathematical Sciences 2

Friday, March 1, 2024 1:00 pm

Mata'yuum

### 251 1:05 pm

Assessing the Capabilities of a Real-time, Portable Fluorometer to Track Sewage Inputs in Urban Creeks

Glorya Escobar, Masters of Science in Civil Engineering with a concentration in Environmental Engineering (M)

### 252 1:25 pm

Flow quality survey of the SDSU Low Speed Wind Tunnel test section using planar PIV

Yuichiro Tobita, Masters of Science Aerospace Engineering, Aerodynamics (M)

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**253 1:45 pm**

A Search for Circumbinary Planets Using Recent TESS Data

Erika Dunning, Masters of Science in Astronomy (M)

**254 2:05 pm**Plasmon-promoted CO<sub>2</sub> reduction in amine-CO<sub>2</sub> adducts

Christopher Turchiano, Doctoral/Chemistry (D)

**255 2:25 pm**

TDDFT study of the absorption spectra of tricyclic cytosine derivatives

Harrison Pearce, Joint Doctoral Program/Chemistry (D)

**256 2:45 pm**

Spectropolarimetry of Type Ia Supernovae: An investigation of the Si II 6355 Feature in SN 2018gv

Julianna Markham-Adkison, Masters of Science in Astronomy (M)

**Session C-9**

Engineering and Computer Science

**Friday, March 1, 2024 1:00 pm**

Metzli

**257 1:05 pm**

Ultrasonic Guided Waves Scattering Spectra by Hybrid Global-Local Modeling for NDE in Composites with Varying Defect Features

Mingyue Zhang, PhD/JDP of Structural Engineering (D)

**258 1:25 pm**

Atomization Feature Identification Tracking and Analysis

Evan Pruitt, Masters of Science Aerospace Engineering (M)

**259 1:45 pm**

Evaluation Of Unmanned Aerial Systems (UAS)-Related Drivers' Distraction Using Eye Tracker Data And EEG Signals

Zainab Afzali Kusha, Masters in Computational Science (M)

**260 2:05 pm**

Material Hybridization for Tunable Performance of 3D Printed Lattice Structures

Brandon Huffman, Masters of Science in Mechanical Engineering (M)

**261 2:25 pm**

Mass Timber-Concrete Footing Connections with Ductility

Ramin Sarange, PhD in Structural Engineering Sciences (JDP) (D)

**262 2:45 pm**

Mechanical Properties of Additively Manufactured Fiber-Reinforced Composites

Anil Singh, MSME (M)

**Friday, March 1, 2024  
Session D: Oral Presentations****Session D-1**

Behavioral and Social Sciences

**Friday, March 1, 2024 3:00 pm**

Legacy Suite

**263 3:05 pm**

THE AFTERMATH OF 'SCOUT ME IN' - What Happened After the Inclusion of Girls in the Boy Scouts of America (BSA)? - An Ethnographic Case Study of Organizational Change

Matalino Lorenzo, Bachelor of Arts in Psychology (U)

**264 3:25 pm**

Robert Schumann: Mental Health and Musical Creations

Hannah Freed, Bachelor of Arts in Music and Bachelor of Arts in Psychology (U)

**265 3:45 pm**

Reinterpreting Narratives about Black Power: Racism, Resistance, and Survival

Hungerford Tiffany, Africana Studies, B.A. in Liberal Arts and Sciences (U)

**266 4:05 pm**

The Phenomenon of Deviance

Eric Curiel, Criminal Justice (U)

**267 4:25 pm**

Does Fair Exist? - A Case Study on Ethics, Decision-Making, and Leadership in the 9/11 Victim Compensation Fund as Shown in the Film "Worth"

Savannah Nix, Communication (U)

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## 268 4:45 pm

The Effect of Ethnic Discernment on Exogamy in the US

Audrey Lacher, **Mathematical Economics (U)**

## Session D-2

Behavioral and Social Sciences 1

**Friday, March 1, 2024 3:00 pm**

Love Library 430

## 269 3:05 pm

Cognitive Approaches to Literature

Jorge Arana, **MA in English (M)**

## 270 3:25 pm

The Impact of Adverse Childhood Experiences on the Experience of Living with Endometriosis

Shea O'Donnell, **Master of Arts in Psychology (M)**

## 271 3:45 pm

Advantages of early linguistic exposure: variation in the perception of Spanish diphthongs by L2 and heritage learners of Spanish

Carolina Vargas, **Masters of Arts in Spanish (M)**

## 272 4:05 pm

Title "Bupe by the Book": An exploration of mental health and social support among unhoused individuals using opioids around San Diego public libraries

Mayra Lam Yuen, **Masters of Social Work (M)**

## 273 4:25 pm

Sexual Assault Prevention: How California Institutions of Higher Education Currently Respond Compared to Previous Review

Samara Camarillo, **Masters of Criminal Justice & Criminology (M)**

## 274 4:45 pm

The Impact of Parental Stress on Child Internalizing and Externalizing Behaviors by Gender

Avery Cardosi, **Master of Arts in Sociology (M)**

## Session D-3

Behavioral and Social Sciences 2

**Friday, March 1, 2024 3:00 pm**

Love Library 431

## 275 3:05 pm

A Culture-Centered Approach to Meanings of Health and Understandings of Environmental Risks Associated with Brownfields Exposure in National City  
Brianna Pham, **Master of Arts in Communication Studies (M)**

## 276 3:25 pm

¿QUÉ ES LA PERTENENCIA?: social constructions of belonging among latinx tutors at a hispanic-serving institution

Rebeca Navarrete, **Masters of Communication (M)**

## 277 3:45 pm

Analyzing the association between starting cancer treatment and the COVID-19 lockdown protocols

Enrick Kyle Fontelera, **Master of Public Health in Epidemiology (M)**

## 278 4:05 pm

Mexican Labor in a Changing Landscape: The Mexicali, Baja California Labor Movement in the 1990s  
Cassandra Garcia, **Master of Public Administration/Master of Arts in Latin American Studies (M)**

## 279 4:25 pm

Machine learning detection of anthropogenic debris in complex floodplain environment

Peaceibisia Jack, **Masters of Science in Geography (M)**

## 280 4:45 pm

Concordance between self-reported hazardous alcohol use by the audit-c and phosphatidylethanol (peth) among heavy drinking fisherfolk men living with HIV in uganda

Doreen Tuhebwe, **Public Health (D)**

## Session D-4

Visual and Creative Arts

**Friday, March 1, 2024 3:00 pm**

Aztlan

## 281 3:05 pm

Yinka Shonibare's Use of African Wax Print Fabrics Question Cultural Identity

Gabrielle Berens, **Masters of Fine Arts (M)**

## 282 3:25 pm

Visualizing Resistance: Decolonized Aesthetics and Subverting Dominant Narratives

Robin North, **Masters of Fine Art (M)**

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### 283 3:45 pm

Man She's Really Cookin': An Analysis of Gender Performativity in Women Instrumentalists During Jazz Improvisation

Sarah Irvin, Masters of Music in Jazz Studies (M)

### 284 4:05 pm

A Kingdom as Great: Navigating Girlhood in "Labyrinth"

Daisy Scott, Master of Arts in English (M)

### 285 4:25 pm

Roadside juveniles: Understanding how interfacing with humans affects juvenile moor macaque (*Macaca maura*) behavior

Dania Abizaid-Herrera, Master of Arts in Anthropology (M)

## Session D-5

Education

Friday, March 1, 2024 3:00 pm

Metztli

### 286 3:05 pm

Parents' Roles and Involvement in an Urban Secondary School's Ambitious Mathematics Program

Esperanza Ochoa, Doctorate of Philosophy - Education (D)

### 287 3:25 pm

Enhancing Rural Students' College Pathways: Incorporating Academic Match and Student Fit Preferences as an Alternative to Undermatch Theory

Catherine Longstreet, Joint Doctoral Program in Education (D)

### 288 3:45 pm

Incorporating Culturally Relevant Pedagogy in Chemistry to Promote Success for Women of Color in STEM

Elizabeth Nguyen, Bachelors/Chemistry and Masters/Organic Chemistry (D)

### 289 4:05 pm

Breaking the Beta: A Critical Inquiry into Problem-Solving

Gabriela Hernandez, MSED program (Math & Science Ed Doctoral) (D)

### 290 4:25 pm

The Departmental Impact of Near-Peer Mentors

Brinley Stringer, PhD in Math Education (D)

### 291 4:45 pm

When Coding Meets Biology: Student Attitudes, Motivations, and Expectations in a Discipline-Based Coding Class

Austin Zuckerman, Ph.D. Mathematics and Science Education (D)

## Session D-6

Humanities, History, Literature, Philosophy

Friday, March 1, 2024 3:00 pm

Mata'yuum

### 292 3:05 pm

Harmony of Resilience: Hip-Hop, Platicas, and the Collective Narratives of Graduate Latina Friends

Jennifer Barajas, Masters of Arts in Women's Studies (M)

### 293 3:25 pm

Lexical Borrowings from English to Spanish in Baja California (México) and Madrid (España)

Vanessa Castro, Master of Arts in Spanish (M)

### 294 3:45 pm

How to Translate a Musical?: Translating Play a Life by Ikko Ueda

Aika Tsuda, Master of Arts in Theatre Arts (M)

### 295 4:05 pm

"Now, by my injuries, old man!" A Dramatic Presentation, In 5 acts. As altered for the SDSU Student Symposium

Karen Diaz de Regules, Master of Arts in Theatre (M)

### 296 4:25 pm

Lost Voices: The 1954 Guatemalan Coup Revisited Through Oral History

Katia Ayala, Master of Arts in Latin American Studies (M)

### 297 4:45 pm

People's engagement with primate habitat signage at the San Diego zoo

Nancy Quidachay, Masters of Arts in Anthropology (M)

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## Session D-7

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Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 3:00 pm**

Visionary Suite

**298 3:05 pm**

The Chinese American League of Justice

Eric Vizcarra, Bachelor of Arts in History (U)

**299 3:25 pm**

E.C. and the Nuclear Unit: What a Difference a Code Makes!

Grace Dearborn, Bachelor of Arts in History (U)

**300 3:45 pm**

Indigenous Art for Perspective

Darya Ardehali, Bachelor of Arts in Global Humanities (U)

**301 4:05 pm**

Are there really Pirates in Beijing? Perceptual Dialectology of Rhoticization in Mandarin

Brianna O'Boyle, Masters of Arts in Linguistics (M)

## Session D-8

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Physical and Mathematical Sciences

**Friday, March 1, 2024 3:00 pm**

Park Boulevard

**302 3:05 pm**

SCS1++: A Tool for Assessing Learning Outcomes of Computer Science Students

David Kaauwai, Computer Science/Mathematics (U)

**303 3:25 pm**

Localized Strained Moiré Material in TMD Hybrid Monolayer-Nanotube Interfaces

Ryan Palmares, Bachelors of Science in Physics (U)

**304 3:45 pm**

Material Characterization of Novel PEDOT Thin Films Produced via oxidative Chemical Vapor Deposition using Volatile Liquid Oxidants

Mary Becker, Bachelors of Science in Physics (U)

**305 4:05 pm**

The Role Iron in the Photoinitiated Growth of Silver Nanoparticles

Joseph Charlonis, Masters of Science in Chemistry (M)

**306 4:25 pm**

Kepler-8610483b: The First Potential High-Inclination Circumbinary Planet

Christopher Christopher Chase Martin, Masters of Astronomy (M)

## Session D-9

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Education

**Friday, March 1, 2024 3:00 pm**

Pride Suite

**307 3:05 pm**

Science-Based Art Activities Facilitate the Development of Scientific Knowledge and Techniques in Pre-Service Teachers

Maraliz Fischler-Barraza, Math, and Science Education Joint Doctoral Program (D)

**308 3:25 pm**

"So Someone Like Me Can Be in Academia?" The Role of Mentoring in a Community College Undergraduate Research Program

Danielle Huddlestun, Joint Doctoral Program in Education (D)

**309 3:45 pm**

Empty promises, broken policies: How State and Federal legislation affects servingness at Hispanic Serving Institutions in STEM

Daniela Hernandez, Bachelor of Arts in Interdisciplinary Studies (U)

**310 4:05 pm**

Cultivating genuine learning: Instruction and incentives for students to constructively use artificial intelligence tools

Alana Rio, Bachelor of Arts in Psychology and Philosophy (U)

**311 4:25 pm**Educational Frontiers: A Comparative Study of K-12 Experiences in San Diego's Diverse Neighborhoods  
Gabrielle Jose, Bachelor of Arts in English for Single Subject Teaching + B.A. in Comparative International Studies (U)**312 4:45 pm**

Beyond Excited and Anxious: Student Influences and Emotions Towards Their Career Search

Hazel Fernandez, Bachelor of Arts in Sociology (U)

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## Friday, March 1, 2024

### Session E: Oral Presentations

#### Session E-1

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Henrietta Goodwin Scholars Session 1

**Friday, March 1, 2024 1:00 pm**

Templo Mayor

**50 1:00 pm**

Affects of Gentrification in San Diego

**DeAnza Palmer, Child Development (U)****51 1:00 pm**

Why are Black Women in Sports are Perceived Badly in The Media?

**Brenna Barnes, Bachelors (U)****52 1:00 pm**

Social Media Impact on black adolescent education

**Theodore Godfrey, Kinesiology pre-pt (U)****53 1:00 pm**

Affirmative Action: Equity not Equality

**Milanarafa Abdalla, Cellular and Molecular Biology (U)**

#### Session E-2

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Henrietta Goodwin Scholars Session 2

**Friday, March 1, 2024 3:00 pm**

Templo Mayor

**55 3:00 pm**

Black Students experiences within higher education

**Nyana Martin, Biology (U)****56 3:00 pm**

Increasing the Enrollment of Black Students at San Diego State University

**Camryn Cabine, Undeclared - Planning to enter Public Health (U)****57 3:00 pm**

Is there a stigma to mental health for Black students?

**Jhacib Blenman, Kinesiology (U)****58 3:00 pm**

Credit Where Credit is Due: Exploring the Factors of Misrepresentation of African Americans in Media and Pop Culture

**Layla Jones, Bachelor/Psychology (U)**



## Poster Presentations

Friday, March 1, 2024

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Sessions F-I

Poster presenters are required to stand by their poster during the entire 1-hour and 30 minute discussion period.

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## Friday, March 1, 2024

### Session F: Poster Presentations

#### Session F-1

Behavioral and Social Sciences 1

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**318 9:00 am 1**

Over-the-Counter Hearing Aids: How user-friendly are they?

**Magdalen Acker, Speech Language and Hearing Sciences (U)****319 9:00 am 2**

Exploring the Predictive Role of ACEs and Cognitive Ability in Posttraumatic Cognitions

**Kerris Woods, Bachelor of Arts in Psychology (U)****320 9:00 am 3**

Binge drinking is associated with altered neurobehavioral indices of cognitive control: Local and network - level fMRI analysis

**Ashley Simard, Bachelors of Sciences in Psychology (U)****321 9:00 am 4**

Verbal fluency varies by sex among Hispanic/Latino stroke survivors

**Rachel Membreno Almdares, Bachelor's of Art in Psychology (U)****322 9:00 am 5**

Time Spent on Social Media and Its Impact on Body Satisfaction

**Drew Curley, Bachelor of Arts in Psychology (U)****323 9:00 am 6**

The Influence of Phonetic Complexity on Speech Motor Control in Children with Cerebral Palsy

**Maya Elden, Speech, Language, and Hearing Sciences (U)****324 9:00 am 7**

Automated Detection of Archaeological Sites from Satellite Imagery

**Kylie Coughlin, Anthropology (U)**

#### Session F-2

Behavioral and Social Sciences 2

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**325 9:00 am 8**

Age of acquisition and hearing status impact proficiency in American Sign Language

**Ayden Kpormegbey, Bachelor of Arts in Speech, Language and Hearing Sciences (U)****326 9:00 am 9**

ActiveU

**Sofia Spies, BS Biology (U)****327 9:00 am 10**

Consultation Protocols as a Strategy for Indigenous Groups in Latin America to Protect their Rights and Territories

**Jacob Gallardo, Bachelor of Arts in Psychology (U)****328 9:00 am 11**

Navigating Cancer Care at the US-Mexico Border

**Julio Aguililar, Psychology (U)****329 9:00 am 12**

Veteran Military Leaders' Perceptions of Their Subordinates' Mental Health Care Use: A Qualitative Investigation

**Hayley Myers, Psychology (U)****330 9:00 am 13**

Investigating the Behavioral Response to Visual Object Stimuli ("In Progress")

**Lauren Magliocco, Bachelor of Arts in Psychology (U)****331 9:00 am 14**

How do Latine Mothers Use Social Media to Support their Parenting and Children's Learning?

**Marquita Scott, Major bachelor's in child and Family Development Minor Counseling and Social Change (U)**

#### Session F-3

Biological and Agricultural Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**333 9:00 am 16**

Role of macrophages in the development of ovarian cancer stem-like cells during chemotherapy

**Isabella Amador, Biology (U)**

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**334 9:00 am 17**

Visible Light-mediated Quantum Dot Photocatalysis for Plastic Wastes Upcycling

Jingtong Chai, Bachelor of Biochemistry in Chemistry (U)

**335 9:00 am 18**Understanding gut colonization and adherence by a microbiome bacteria in the *Caenorhabditis elegans* model

Jace Buxbaum, Cellular and Molecular Biology (U)

**336 9:00 am 19**

Seed depth limits emergence of an invasive shrub in Southern California

Allison Allain, BS - Biology (U)

**337 9:00 am 20**Observational Study of Dorsal Abdomen Hairs: *Micrathena* vs. *Gasteracantha* and Their Differences Under SEM

Francesca Hoang, Bachelors in Applied Arts and Sciences, Microbiology (U)

**338 9:00 am 21**

Generation of patient specific and transplantable hematopoietic stem and progenitor cells

Xuefan Shi, Bachelor of Cellular and molecular biology (U)

**339 9:00 am 22**

Searching for new bacterial pathogen with a Host-Bacteria Interactions Workshop

Yesenia Rodriguez, Chemistry with an emphasis in Biochemistry (U)

**Session F-4**

Engineering and Computer Sciences 1

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**340 9:00 am 23**

Comparative Evaluation of Lunar Regolith-Based Tiles for Lunar and Launching Pads: Static Load and Thermal Performance Analysis

Shezreen Khan, Aerospace Engineering (U)

**341 9:00 am 24**

Analysis of Dry and Wet Weathered Plastic Marine Debris using Scanning Electron Microscopy

Trinity Magdalena-Weary, B.S. Environmental Engineering (U)

**342 9:00 am 25**

Fabrication of Patient-Specific Aorta Models for Flow Visualization

Audrey Meador, Mechanical Engineering Bioengineering Emphasis (U)

**343 9:00 am 26**

Creating an Automated Water Current Setup to Assay Rheotaxis in Planarians

Roberto Burciaga, Bachelors of Engineering in Mechanical Engineering (Bioengineering) (U)

**344 9:00 am 27**

Bridging the gap between engineering and society: communicating earthquake risk via media

Alyssa Yearick, Bachelor of Science in Business Administration - Marketing: Specialization in Integrated Marketing Communications (IMC) (U)

**345 9:00 am 28**Machine Learning Models for Predicting the Yield Strength and Young's Modulus of High Entropy Alloys  
Oscar Osuna, Bachelor of Science in Mechanical Engineering (BSME) (U)**Session F-5**

Engineering and Computer Science 2

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**346 9:00 am 29**

Development of Laboratory System for Engineering Guided Waves in Shear Wave Elastography for Enhanced Soft Tissue Diagnostics

Paul DeStefano, B.S. Molecular and Cell Biology (U)

**347 9:00 am 30**

Quantum Leap in Strategy: Reshaping Arms Races and Advertising with Quantum Game Theory

Samuel Braude, Computer Science (U)

**348 9:00 am 31**

Collection of sEMG dataset for Silent Speech Recognition

Alexander Cherry, Bachelor of Science, Mechanical Engineering (U)

**349 9:00 am 32**

Mechanical properties of seawater glass fiber polymer reinforced concrete

Timothy Park, civil engineering (U)

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**350 9:00 AM 33**

An Assessment of the Use of Multiple Human-Associated Fecal Source Tracking Markers to Monitor Fecal Pollution Moving Through Subsurface Soils

Tanaka-Herrera Charisma, Environmental Engineering (U)

**351 9:00 AM 34**

Creating an App for Medical Data Collection

Hector Anaya, Bachelor of Science in Computer Science (U)

**352 9:00 AM 35**

Temporal Wastewater Degradation of TRP & CDOM

Selin Childs, Bachelor of Science in Environmental Engineering (U)

**Session F-6**

Physical and Mathematical Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**353 9:00 am 36**

Characterization of 3D Printed Fiber-Reinforced Composites

Ansel Flanagan, Aerospace Engineering (U)

**354 9:00 am 37**

Analysis of Grain Size and Organic Matter Content in the Benthic Zone of Tijuana River Estuary

Callie Summerlin, Environmental sciences (U)

**355 9:00 am 38**

Biological Evaluation and Chemical Synthesis of Carmaphycin "War-heads" as Potential Treatments Against *Trichomonas Vaginalis* and Various Cancers

Brandon Ismael Gonzalez, Bachelor of science in Chemistry emphasis in Biochemistry (U)

**356 9:00 am 39**

Converting biomass-derived compounds to value-added products by electrochemical oxidation

Claire Baeriswyl, Bachelor of Science in Chemistry (U)

**357 9:00 am 40**

Investigating the effective temperature of red supergiants

Beatriz Miranda Abreu, Bachelor of Sciences in Astronomy (U)

**Session F-7**

Health, Nutrition, and Clinical Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**358 9:00 am 41**

Faith in Motion: Collaborative Strategies with Church Staff for Implementing Physical Activity Programs

Carolina Costa, Bachelor of Arts in Psychology Neuroscience Emphasis (U)

**359 9:00 am 42**

The Impact of Diet on Traumatic Brain Injury Responses of Adult Fruit Flies

Robert Squier, Bachelor of Science in Microbiology (U)

**360 9:00 am 43**

People's Produce Mobile Farmers' Market: Addressing Food Apartheid in Southeastern San Diego

Andrea Meza, Bachelor of Science in Public Health (U)

**361 9:00 am 44**

Smoke Exposure in Various Public Locations

Amelia Allison, Bachelor of Public Health (U)

**362 9:00 am 45**

Recovery of muscle torque after lengthening contraction injury in cigarette smoke-exposed mice

Tyler McClure Kent, Bachelor of Science Kinesiology Emphasis in Pre Physical Therapy (U)

**363 9:00 am 46**

Relationship between unintentional finger force drifts and surface texture

Mia Naranjo, B.A. in Psychology, Emphasis in Neuroscience; B.S. in Kinesiology, Emphasis in Pre-Physical Therapy (U)

**364 9:00 am 47**

Bilingual elementary students' awareness and self-report of their language proficiency

Viridiana Apodaca, Bachelor of Arts in Speech, Language, and Hearing Sciences (U)

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## Session F-8

Behavioral and Social Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**365 9:00 am 48**

Sensitive early detection of chronic traumatic encephalopathy related biomarkers using nonlinear multi-photon laser wave-mixing spectroscopy

**Nino Shatirishvili, Chemistry (D)****366 9:00 am 49**

Untangling Ancient Health: Comparative study of Dental and Skeletal Markers of Disease in Lower Río Verde Valley, Oaxaca, Mexico

**Zachery Clow, Masters of Arts in Anthropology (M)****367 9:00 am 50**

Investigating the Effects of Family Structure on Early Language Acquisition

**Noemi Garcia Rodriguez, Masters of Arts in Psychology (M)****368 9:00 am 51**

Investigating the Influence of Cardiovascular Risk Factors on White Matter Atrophy in the Parahippocampal Gyrus and Entorhinal Cortex

**Hector Reyes, Masters of Arts in Psychology (M)****369 9:00 am 52**

Supporting Emergent Multilingual Learners' Informal Science Education Experience

**Rose Anh Do, M.A. Education - Dual Language & English Learner Education (Outside Specialization) (M)****370 9:00 am 53**

"My Barber is Like a Therapist": The Influence of Trauma-Informed Advocacy on Psychological Openness and Help-Seeking Behaviors Among African American Males During a Barber Visit

**John William Edwards, III, Masters of Social Work (M)****371 9:00 am 54**

Transient and Continuous Neural Indices of Attention Selection and Suppression in Anxiety

**Ryan Shriver, MA in Psychology (M)****372 9:00 am 55**

The Control Conundrum: Unpacking the Relationship between Personality Traits and Policing Effectiveness

**Hannah Valley, Masters of Science in Industrial-Organizational Psychology (M)**

## Session F-9

Biological and Agricultural Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**373 9:00 am 56**

Catalytic dependence on K72 electrostatic contribution in isocitrate dehydrogenase 1

**Brittany Conley, JDP/PhD Biochemistry (D)****374 9:00 am 57**

Hunting for genomic fossils: Inferring the characteristics of ancient polyploidization events from modern plant genomes

**Tamsen Dunn, PhD in Evolutionary Biology (D)****375 9:00 am 58**

Development of in vitro Raf activation assays on supported lipid bilayers

**Alexia Morales, Masters of Science in Chemistry (M)****376 9:00 am 59**

Effects of trichloroethylene metabolite S-(1,2-dichlorovinyl)-L-cysteine on extravillous trophoblast viability and invasion capacity under hypoxic and normoxic conditions

**Frances Stein, Masters of Science in Environmental Health (M)****377 9:00 am 60**

A single-molecule recruitment rate of Raf on Ras-membranes

**Kesaria Tevdorashvili, Masters in Chemistry (M)****378 9:00 am 61**

Design and implementation of a photobioreactor for the cultivation of microalgae results in increased growth rates and productivities

**Salatiel Garcia Nava, Mechatronics (M)****379 9:00 am 62**

Investigating DNA Modifications That Determine the Host Range of Achromobacter Bacteriophages

**Yasaman Farokhi Soofi, Master of Science in Chemistry and Biochemistry (M)****380 9:00 am 63**

The role of obese preadipocytes in the ovarian cancer tumor microenvironment

**Sofia Howe, Cell and Molecular Biology (M)**

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## Session F-10

Engineering and Computer Science

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**381 9:00 am 64**

Surface and subsurface flows in different wildfire-affected landscapes

**Ramya Chandrasekaran, Graduate/Civil Engineering (M)**

**382 9:00 am 65**

Development and Validation of an Apparatus to Improve the Efficiency of NASA-STD-6001B Test 1 Flammability Test

**Jarred Druzynski, Masters of Science in Mechanical Engineering (M)**

**383 9:00 am 66**

Characteristics of a Two-Dimensional Turbulent Wall Jet over a Convex Surface of a Constant Radius

**Bryan Tan, Master of Science in Mechanical Engineering (M)**

**384 9:00 am 67**

Modeling Sediment Transport and Sedimentation in the Lower Alvarado Creek Watershed

**Patrick Fassell, M.S. in Civil Engineering (M)**

**385 9:00 am 68**

The Impact of Structure Loss on Water Quality and Supply After Wildfires in California

**Savannah Regan, Masters of Science Water Resources Engineering (M)**

## Session F-11

Physical and Mathematical Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**386 9:00 am 69**

Modeling Water Quality Dynamics in the Tijuana Estuary: A CE-QUAL-W2 Approach

**Coty Huneau, MS Watershed Science (M)**

**387 9:00 am 70**

The Direct Detection of Gas Inflow onto Galaxies between  $z \sim 0.65$  and  $z \sim 2.35$

**Andrew Pitts, Masters of Science in Astronomy (M)**

**388 9:00 am 71**

Constraining Properties of the Cool Disk-Halo Interface using CloudFlex

**Nissia Indradjaja, Masters of Science in Astronomy (M)**

**389 9:00 am 72**

Development of a fluorescence-based assay to visualize protein-protein interactions implicated in inflammatory-based diseases

**Caden Unholz, Master's/Master of Science in Chemistry (M)**

**390 9:00 am 73**

Mathematical Models of HIV Infection in the Brain: Implication to Effective Treatment Regimens

**Audrey Oliver, Master of Science in Computational Science (M)**

**391 9:00 am 74**

Modelling Protostars with Variable Accretion Rates

**Zoe Bozich, Masters of Science in Astronomy (M)**

**392 9:00 am 75**

Bioconjugation of Gold Nanoparticles to Rare Earth Element Binding Proteins

**Sierra Murrell, Masters of Science Chemistry (M)**

## Friday, March 1, 2024

### Session G: Poster Presentations

#### Session G-1

Behavioral and Social Sciences 1

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**393 11:00 am 1**

Making a Fresh Start: The Impact of California Resentencing Policies in San Diego County

**Isabella Todd, Bachelors of Arts Political Science (U)**

**394 11:00 am 2**

Interactions between History of Traumatic Brain Injury and Sex on Cognition among Hispanic/Latino Adults

**Rubi Carpio Flores, Bachelor of Arts in Psychology: Emphasis in Neuroscience (U)**

**395 11:00 am 3**

Examining Autistic Adults' Driving Skills and Needs Through Driving Simulator Sessions

**Marialsabel Miller, Bachelor of Arts in Psychology (U)**

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**396 11:00 am 4**

Education moderates the associations of family history of cognitive impairment with cognition among Hispanic/Latino adults

**Shaun Goycoochea, Bachelor of Arts in Psychology (U)**

**397 11:00 am 5**

The Associations between Alcohol Usage and Cognitive Performance amongst Adults in the Hispanic/Latino Community

**Armando Lemus, Psychology (U)**

**398 11:00 am 6**

The Impact of Early Intervention Services on Communication Development of Children with Autism

**Aoi Mori, Bachelor's of Science in Child Development (U)**

**399 11:00 am 7**

The Increase in Mother-Daughter Closeness After Participation in the Conmigo Program: An Intervention Program for Latina Mothers and Daughters

**Marian Carbajal, Undergraduate - Psychology, B.A. (U)**

## Session G-2

Behavioral and Social Sciences 2

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**400 11:00 am 8**

Association of Adverse Childhood Experiences with Cigarette Smoking and Alcohol Use in a Low Income Migrant Community on the US-Mexico Border

**Anali Cruz, BA Psychology (U)**

**401 11:00 am 9**

Association of Social Support with BMI and Obesity in a Low Income Migrant Community on the US-Mexico Border

**Jasmine Rincon, Bachelors in Psychology (U)**

**402 11:00 am 10**

Social Touch and Close Connections: The Effects of Warmth and Deep Pressure

**Kylie Hawkins, Bachelor of Arts in Psychology (U)**

**403 11:00 am 11**

Parents engagement in their child's mental health services based on ethnicity

**Jessica Lopez, Bachelors of Science Child and Family Development (U)**

**404 11:00 am 12**

Stigmatization of Public Housing: A Sociological Exploration of the Frontier Housing Project

**Belen Rashidi, Sociology BA (U)**

**405 11:00 am 13**

Concussion Care Seeking Intentions and Behavior Does Not Differ Between Ethnicities in Collegiate Athletes

**Mikaela Garcia, Kinesiology, Pre-Physical Therapy (U)**

## Session G-3

Biological and Agricultural Sciences

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**406 11:00 am 14**

*Mytilus galloprovincialis* heart rate and valve-gaping behavior in response to acute salinity stress

**Miles Ghannadian, Biology with an emphasis in marine biology (U)**

**407 11:00 am 15**

The Role of Nutrients and Climate Change in Shallow Water Estuarine Dissolved Oxygen Dynamics

**Samantha Irwin, B.S. in Biology (U)**

**408 11:00 am 16**

The Impact of Diet on Traumatic Brain Injury Responses of Adult Fruit Flies

**Robert Squier, Bachelor of Science in Microbiology (U)**

**409 11:00 am 17**

A Gene Regulator (MacR) Controlling the Production of Molecular Syringes and their Application for Biotechnology

**Alpher Alpher Aspiras, Bachelor of Science in Cell and Molecular Biology (U)**

**410 11:00 am 18**

Understanding the role of conjugative plasmids in commensal-like bacterial adherence to the intestinal epithelium of *C. elegans*

**Aaliyah Ringor, Microbiology (U)**

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**411 11:00 am 19**

Mutations in targeted *Achromobacter xylosoxidans* selected in response to phage therapy in the lungs of a cystic fibrosis patient

**Branden La Madrid, Bachelor of Science (U)**

**412 11:00 am 20**

Understanding Changes in Temperature and Heat Index in Imperial Valley, CA

**Samantha Madonia, Bachelor of Science in Environmental Sciences (U)**

**413 11:00 am 21**

Behind the Basket: Investigating the Nuclear Pore Complex Localization Domain of Megator in *Drosophila*

**Tristan McDonnell, Bachelor of Science in Biology with Emphasis in Cellular and Molecular Biology (U)**

**Session G-4**

Engineering and Computer Science

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**414 11:00 am 22**

Machine-Learned Interatomic Potential for Grain Boundary Segregation in a Nichrome Alloy

**Hadia Hadia Bayat, Mechanical Engineering with Emphasis in Bioengineering (U)**

**415 11:00 am 23**

Enhancing the SCS1 Assessment

**Sophie Krivosov, Computer Science (U)**

**416 11:00 am 24**

The effect of temperature distribution of powder bed in selective laser sintering on the quality of 3D-printed parts

**Kyler Brown, Bachelor of Electrical Engineering (U)**

**417 11:00 am 25**

Study of Thermal, Acoustical and Mechanical Properties of Xanthan Gum and Hemp Building Materials

**Sama Ahmed, Civil Engineering/ Bachelors (U)**

**418 11:00 am 26**

Exploring the Advancements in Additive Manufacturing through the Application of Artificial Intelligence

**Karam Alshaikh, Bachelor of Science in Mechanical Engineering (U)**

**419 11:00 am 27**

Exploring the Utility of Machine Learning Enhanced FEA in the Field of Metal Additive Manufacturing

**Luis Laurean, Bachelor of Science in Mechanical Engineering (U)**

**Session G-5**

Physical and Mathematical Sciences

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**420 11:00 am 28**

The impact of invasive plant species on fire patterns in Otay Valley Regional Park, San Diego

**Anahi Mendez Lozano, Environmental Engineering (U)**

**421 11:00 am 29**

Diel Cycles of Stem Water Potentials for Implications of Hydrological Connectivity between Hillslopes and Streams at the Angelo Coast Range Reserve

**Sirena Rodriguez, Bachelor of Science in Environmental Sciences (U)**

**422 11:00 am 30**

How Does Foliage Cover Affect Water Temperature and Thermal Microrefugia for Trout Populations in the South Fork of the Eel River?

**Jessica Keiser, Environmental Science (U)**

**423 11:00 am 31**

Thermal Properties of Vb- Defect in hBn

**Alberto Pulido, Physics (U)**

**424 11:00 am 32**

R132H IDH1 mutant efficiency with modify  $\alpha 10$  helix

**Aaron Le, Biochemistry (U)**

**425 11:00 am 33**

DES as novel reaction media for the investigation of amino acids for detection of past life

**Christian Sandoval, Bachelor of Science Microbiology CLS (U)**

**426 11:00 am 34**

Utilizing Conformational Control as a Filter to Obtain Selective 3-Aryl Pyridone Kinase Inhibitors

**Aaron Roberts, B.S. in Cell and Molecular Biology (U)**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Session G-6

Health, Nutrition, and Clinical Sciences 1

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**427 11:00 am 35**

Determining the Best Practices for Providing End of Life care to Young adults with Terminal Cancer

Kaylee Chirgwin, Bachelor of Science in Nursing (U)

**428 11:00 am 36**

Diaphragm Force and Mitochondrial Function Ex Vivo Following GSNOR Inhibition In Vivo Preceding Mechanical Ventilation

Simon Pierce, Kinesiology (U)

**429 11:00 am 37**

Olfactory Nudging promotes short-term weight loss

Victoria Esparza, Foods and Nutrition (U)

**430 11:00 am 38**

Tube Feeding in Dementia: A Literature Review on Nutritional Outcomes and Complications

Christopher Le, Bachelors of Science in Nursing (U)

**431 11:00 am 39**

Designing Research Diets Using USDA Food Composition Tables and ICP-OES

Christina Vialva, Chemistry (U)

**432 11:00 am 40**

Leached chemicals from secondhand blue and red cotton-polyester microfibers

Tina Tran, Bachelor of Science in Environmental Sciences (U)

**433 11:00 am 41**

The Role of Mother's in Preadolescent Latinas Health and Eating Behaviors

Mia Quintana, Bachelor of Arts in Psychology (U)

## Session G-7

Engineering and Computer Science 5

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**434 11:00 am 42**

Chipulines Cricket Chips: Jump to a More Sustainable Snack

Daisy Lopez, Bachelor of Science Foods and Nutrition (U)

**435 11:00 am 43**

Comparing Reporter Versions for Executive Functioning Skills

Bailee Chynoweth, Bachelor of Psychology (U)

**436 11:00 am 44**

Health Care System Changes to Receipt of Cervical Cancer Screening Among Women Living with HIV in India: A Qualitative Study

Emily Hernandez Rincon, Psychology with and Emphasis in Neuroscience (U)

**437 11:00 am 45**

Association Between Pain Severity and Low Back Movement During Functional Activities in Latino People with Chronic Low Back Pain

Viridiana Holguin Solorio, Bachelor of Arts in Psychology (U)

**438 11:00 am 46**

Implicit Bias, Nursing Competency, and Patient Satisfaction: A Literature Review

Dakotah Behrendt, Bachelor of Science in Nursing (U)

**439 11:00 am 47**

Olfactory Training Wearables for Smell Loss - A Literature Review

Kylie Macias, Bachelor of Science in Foods and Nutrition (U)

## Session G-8

Behavioral and Social Sciences

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**440 11:00 am 48**

Using Structural Equation Modelling for Understanding Relationships Between Students' Attitudes Towards Science and Science Career Choice

Abel Sekone, Doctor of Philosophy in Mathematics and Science Education (D)

**441 11:00 am 49**

Feasibility and Acceptability of Ecological Momentary Assessment (EMA) Methods among LGBTQ+ Adolescent Tobacco and Nicotine Users

Salgin Linda, PhD Public Health - Health Behavior (D)

**442 11:00 am 50**

Beyond Borders: Understanding Cross-Cultural Variations in Implicit Skin Tone Preferences

Devanshi Upadhyaya, Masters of Arts in Psychology (M)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

**443 11:00 am 51**

Exploration of the Motivation to Control Prejudice towards Arab/Muslims at Individual and County Levels  
**Ashar Abdallah, Masters of Arts in Social Psychology (M)**

**444 11:00 am 52**

Opportunities to improve sleep and circadian health in active duty service members  
**Emily Leslie, MPH Health Promotion and Behavioral Sciences (M)**

**445 11:00 am 53**

Caregiving History and Attachment State of Mind in Foster Caregivers  
**Lucyann Atkins, Masters of Science in Child Development with a concentration in Early Childhood Mental Health (LPCC) (M)**

**446 11:00 am 54**

The Effects of Choline Supplementation and Exercise on Fetal Alcohol Spectrum Disorders  
**Ilse Fleischer, Masters of Arts in Psychology (M)**

**447 11:00 am 55**

The Spanish Lexicon and New English Lexical Loans  
**Corregidor Luna Eva Maria, Masters in Spanish (M)**

## Session G-9

Biological and Agricultural Sciences  
**Friday, March 1, 2024 11:00 am**  
Montezuma Hall

**448 11:00 am 56**

A Special New Software to Fill in Deficiencies in Trout Identification  
**Raya Esplin, PhD in Evolutionary Biology (D)**

**449 11:00 am 57**

Intracellular Consequences of IDH1 Mutations in U87MG Cells  
**Grace Chao, PhD Cell and Molecular Biology (D)**

**450 11:00 am 58**

Unveiling the Role of ID1-4 proteins in Cancer Stem-like Cell Maintenance and Contribution to Ovarian Cancer Recurrence Following Chemotherapy  
**Megan Keene, Cell and Molecular Biology Joint Doctoral Program (CMB JDP) (D)**

**451 11:00 am 59**

A Machine Learning Approach to Predicting Tumor Status through Telomere Length Variation (TLV) Analysis  
**TPriyanshi Shah, Masters of Science in Bioinformatics and Medical Informatics (M)**

**452 11:00 am 60**

Shrinking Coastlines: Use of Uncrewed Aerial Systems to Map and Monitor Rocky Intertidal Habitats  
**Elizabeth Bushnell, Masters of Science in Geography (GIS & remote sensing pathway) (M)**

**453 11:00 am 61**

Impact of Repeated Heat Stress on *Boecheera depauperata*  
**Nathen Walton, Masters of evolutionary biology (M)**

**454 11:00 am 62**

Characterizing Extracellular Vesicles Released by Differentiated Extravillous Trophoblasts  
**Omar Omar Shawn, Master of Science in Molecular Biology (M)**

**455 11:00 am 63**

Utilizing ultra-high spatial resolution drone imagery and satellite spectral vegetation indices (SVI) to study Payments for Ecosystem Services (PES) Zones in Chitwan, Nepal  
**Brenna Fowler, Master in Geography (M)**

## Session G-10

Engineering and Computer Science  
**Friday, March 1, 2024 11:00 am**  
Montezuma Hall

**456 11:00 am 64**

A 'Trap-and-Zap' Technology for Cost-Effective Removal and Destruction of Aqueous Phase Per- and Polyfluoroalkyl Substances (PFAS) at DoD Sites  
**Rodney Leary, Joint Doctoral Program Engineering Science (Mechanical and Aerospace) (D)**

**457 11:00 am 65**

Cyber Vulnerabilities San Diego  
**Anthony Tanay, Homeland Security (M)**

**458 11:00 am 66**

Inspiring Mindful Consumption with Compassionate AI  
**David Elizondo, Master of Business Administration (M)**

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**459 11:00 am 67**

Thermomechanical Properties of Polyurea Elastomeric Foam

Sean Eckstein, Masters of Science in Mechanical Engineering (M)

**460 11:00 am 68**

In the Tijuana River Estuary, how do rates of fecal indicator bacteria reduction from the border to the estuary compare to the degradation rates of other wastewater surrogates?

Alexandra Grant, Masters in Civil Engineering (M)

**Session G-11**

Physical and Mathematical Sciences

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**461 11:00 am 69**

Kinetic and Structural Characterization of Human Isocitrate Dehydrogenase 1

Elene Albekioni, Doctor of Philosophy in Chemistry (D)

**462 11:00 am 70**

Nickel-doped Perovskite Nanocrystals for Selective Allylation of Indoles

Nhu Dang, Chemistry (D)

**463 11:00 am 71**

Phase Separation of Galectin-3 on the Lipid Membranes

Ani Chakhrakia, Chemistry/Joint Doctoral Program (D)

**464 11:00 am 72**

BRAF binding specificity to KRAS4B on a lipid bilayer is controlled by specific regulatory domain interactions

Julian Grim, Doctorate/Chemistry and Biochemistry (D)

**465 11:00 am 73**

Gotta Assess 'Em All: Evaluating the Ecological Health of Alvarado Creek With Multimetric Indices

Tierney Kim, Masters of Science in Civil Engineering [Environmental Engineering] (M)

**466 11:00 am 74**

Synthesis of atropisomeric selective RET kinase inhibitor

Ariel Pernela, Masters of Science in Chemistry (M)

**467 11:00 am 75**

Comparing membrane interactions of RAF isoforms

Vasili Revazishvili, Master of Science in Chemistry and Biochemistry (M)

**Friday, March 1, 2024  
Session H: Poster Presentations****Session H-1**

Behavioral and Social Sciences 1

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**468 1:00 pm 1**

Identifying Age Disparities in Student-Counselor Interactions: A Quantitative Communication Study on Feelings of Dismissal

Miranda Mergens, Bachelor of Science in Health Communication (U)

**469 1:00 pm 2**

Are Sound Baths an Answer to SDSU Student Stress? Lack of Access Suggests Not Yet

Emma Fitzpatrick, Anthropology (U)

**470 1:00 pm 3**

The Connections Between Interoceptive Sensibility to Thermoregulatory Symptoms and Social Anxiety

Elijah Bautista, Bachelor of Arts in Psychology (U)

**471 1:00 pm 4**

Chronic spine pain is associated with altered neural oscillatory dynamics during inhibitory control

Sophie Gumanovski, Bachelor of Arts in Psychology: Emphasis in Neuroscience (U)

**472 1:00 pm 5**

Cooperation in STEM labs benefits student competency and authenticity

Jenna Majors, Bachelor of Arts in Psychology (U)

**473 1:00 pm 6**

Initial Validation of a Mandarin Sentence Comprehension Tool for Bilinguals With Aphasia: Evidence From Healthy Individuals

Emily Mu, Speech, Language, and Hearing Sciences (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

**54 1:00 pm 76**

Exploring the Role of Parental Monitoring and Peer Affiliation in Reducing Delinquency among At-Risk Adolescents

Liana Parrish, Bachelor of Arts in Psychology (U)

**Session H-2**

Behavioral and Social Sciences 2

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**474 1:00 pm 7**

Engaging Nursing Students in Service Learning to Understand Rural Communities

Malia Huff, Bachelor of Sciences in Microbiology (U)

**475 1:00 pm 8**

Youth 4 SDGs: Better Health, Brighter Future! Public Perception, Attitudes, and Behaviors Towards the United Nations Sustainable Development Goals in Youth of San Diego, California and Paris, France

Lillian Eckoff, BS- Environmental Science (U)

**476 1:00 pm 9**

Understanding Unregulated Provisioning of Moor Macaques for Conservation Efforts in South Sulawesi, Indonesia

Amaru Marchant Simonsen, Environmental Sciences B.S. (U)

**477 1:00 pm 10**

Investigating the Neural Dynamics of Face Processing: Comparison of Time-, Time-Frequency, and Frequency-Domain EEG Analysis Methods

Dylan Instone, Bachelor of Arts in Psychology (U)

**478 1:00 pm 11**

An Exploratory Study on the Relationship between Adverse Childhood Experiences and Need for Closure

Ingrid Anna Yu, Bachelor of Arts in Psychology (U)

**479 1:00 pm 12**

Intersecting Identities: Empowerment through Undergraduate Autoethnographies

Emily Christina Le, Bachelor of Arts in Psychology with an emphasis in Neuroscience (U)

**480 1:00 pm 13**

Are There Differences in Motivation of Engagement in Services between Latino and Non-Latino Caregivers?

Brianna Maldonado, Child and Family Development (U)

**Session H-3**

Biological and Agricultural Sciences 1

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**481 1:00 pm 14**

Species richness does not predict phylogenetic or functional diversity in managed grassland plant communities

Alec Juliano, Bachelor of Science in Biology with an Emphasis in Ecology (U)

**482 1:00 pm 15**

Aquatic Toxicological Assessment of Electronic Tobacco Products: Hazardous to California Wildlife

Elora Shakoor, Bachelor of Science in Public Health (U)

**483 1:00 pm 16**

Factors required for Nuclear Pore Complex Rejuvenation in Drosophila Oogenesis

Tram Nguyen, Bachelor of Science in Biology (U)

**484 1:00 pm 17**

Understanding the Effects of Chemotherapy on a Fibroblast Cell-Derived Matrix

Mena Shammass, Bachelor of Science/Microbiology (U)

**485 1:00 pm 18**

Soil Temperature Profile Exploration of Thermokarst Features

Kristine Bernabe, Biology, Emphasis in Ecology, B.S. in Applied Arts and Sciences (U)

**486 1:00 pm 19**

Fetal Pancreatic Genetics in Lipogenesis and Type 2 Diabetes through Fetal Epigenomics

Aneesa Mahmood, Biology (U)

**487 1:00 pm 20**

16S Microbial Alpha Diversity's Negative Effect on Relative Growth Rates on US and Non-US Humulus lupulus L. cultivars

Nathan Bingham, Bachelors of Science in Biology (U)

**488 1:00 pm 21**

Removal of Sulfamethoxazole with a Novel Modified Anaerobic Baffled Reactor

Shiloh Bolden, Bachelor of Science in Environmental Engineering (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Session H-4

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Biological and Agricultural Sciences 2

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**489 1:00 pm 22**

Site-directed mutagenesis and Kinetic analysis in the IDH1 enzyme

**Darius Hyde, Chemistry with an Emphasis in Biochemistry (U)****490 1:00 pm 23**

Purification of Microtubules to Understand Mechanism of Protein Chaperone UNC-45

**Esmeralda Salcedo, Biology, Emphasis in Cellular and Molecular Biology, B.S. in Applied Arts and Sciences (U)****491 1:00 pm 24**

Fluorescence Spectroscopy: A Rapid, Cost-Effective Method of Photo-Resistance Determination

**Ryan Spaulding, Bachelor of Science in Environmental Engineering (U)****492 1:00 pm 25**

Mobile Farmers Market

**Nyla McGlory, Bachelor of Social Science (U)****494 1:00 pm 27**

Isolation of Polar Trifluoroborates

**Dina Shehadeh, bachelors of science in biochemistry (U)**

## Session H-5

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Physical and Mathematical Sciences 1

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**495 1:00 pm 28**

Compression Response of Honeycomb Cores having Sinusoidal In-Plane Waviness Imperfections in Cell Walls

**Shalayah-Naomi Webb, Aerospace Engineering (U)****497 1:00 pm 30**

Precipitation Effect on Groundwater Chemistry in the Angelo Coast Range Reserve

**James Abbott, Geography (U)****498 1:00 pm 31**

The Catalytic Effects of Intercalation of Transition Metal Atoms into Metallic Molybdenum Disulfide

**Gabriella Trulson, Chemistry (U)****499 1:00 pm 32**

Creatinine Analysis through Schirmer Strips and Capillary Electrophoresis

**Carly Nichols, Bachelor of Science in Chemistry (U)****500 1:00 pm 33**

Effects of Non-native Vegetation on Fires in the Urban Mediterranean Systems

**Shruti Gokhale, Environmental Engineering/Bachelor of Science (U)****501 1:00 pm 34**

Seedless, One-Pot Synthesis of Near-Infrared Absorbing Silver Nanotriangles

**Alyse Purdy, Bachelor of Science in Chemistry (U)**

## Session H-6

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Physical and Mathematical Sciences 2

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**502 1:00 pm 35**

UV-Based Optical System for the Fluorescence and Detection of Oceanic Oil Spills

**Alexander McLintock, Bachelors of Science in Physics (U)****503 1:00 pm 36**

A Computational Study of Hydridic Hydrogen Bonds

**David Roberts, Chemical Physics (U)****504 1:00 pm 37**

Photochemical production of silver nanoparticles in the environment via reduction of silver ions by humic acid and fulvic acid

**Peyton Alvarez, Bachelor of Science in Chemistry with an Emphasis in Biochemistry (U)****505 1:00 pm 38**Electrochemical evaluation of solvents for analysis of Mn(II)(Pybox)Cl<sub>2</sub>**Max Root, Bachelor of Science in Biology with a focus in Cellular and Molecular Biology (U)****506 1:00 pm 39**

How Specific Conductivity Analysis Can Aid in Identifying Peak Wastewater Outflow of the Tijuana Estuary

**Cara Higashi, Bachelor of Arts in Geography (U)**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

**507 1:00 pm 40**

Utilizing Dihedral Angle Control as a Strategy to Obtain Selective Diarylamine Kinase Inhibitors

Alyssa Gomez, Bachelor in Chemistry, emphasis in biochemistry (U)

**Session H-7**

Health, Nutrition, and Clinical Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**508 1:00 pm 41**

Effect of Service Learning On Students' Perceptions of Low Income Populations

Lauren Johnston, Bachelor of Science in Nursing (U)

**509 1:00 pm 42**

Single-leg Resistance Exercise Training in Mice Leads to a Decrease Followed by an Increase in In Vivo Torque of Anterior Crural Muscles

Lloyd Kane Thomas Marshall, Bachelor of Science in Kinesiology (U)

**510 1:00 pm 43**

Nitrate Supplementation Decreases In Vivo Muscle Torque Without Affecting Recovery From Injury in Mice

Dylan Kasper, Bachelor of Science in Kinesiology (U)

**512 1:00 pm 45**

Semantic Abilities in Children and the Effects of SES

Noelle Villegas, Bachelor of Liberal Arts in Speech Language and Hearing (U)

**513 1:00 pm 46**

The Effects of Concert Noise Exposure on Hearing in Young Adults

Natalie Ybarrondo, Bachelor of Arts in Speech, Language, and Hearing Sciences (U)

**Session H-8**

Behavioral and Social Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**514 1:00 pm 47**

Growing Together: The Production of Community in San Diego's Urban Gardens

Joya Euceda Victoria, Doctorate in Philosophy in Geography (D)

**515 1:00 pm 48**

The Relationship between Burdensomeness and Social Motivation

Alicia Yee Lok Assang, Masters of Arts in Psychology (M)

**516 1:00 pm 49**

Innovation Orchards: Can innovation-encouraged labs nurture the seedlings of students' motivation and interest in STEM?

Chih-An Bian, Masters of Arts in Psychology (M)

**517 1:00 pm 50**

Neighborhood adversity, social support, and depression and anxiety symptoms in a low-income migrant community on the U.S.-Mexico border

Rebeca Jimenez, M.A. Psychology (M)

**518 1:00 pm 51**

Unstuck and On Target Therapists : A Cultural Lense on Delivering Mental Health Interventions

Jocelyn Dominguez, M.S in Child Development with a Concentration in Early Childhood Mental Health (M)

**519 1:00 pm 52**

Elders' perspectives on the environment: A collaborative exploration for brownfield revitalization in National City, CA

Jacqueleen Weeden, Master of Arts in Geography (M)

**520 1:00 pm 53**

Community Views: A Study on Community Perspectives on Public Restrooms in San Diego County

Malaya Cilley, Master of Public Health (Health Promotion and Behavioral Science) (M)

**521 1:00 pm 54**

The Effects of Choline and Exercise Treatment on Anxiety-Like Behavior Following Prenatal Alcohol Exposure

Liana Manriquez, Masters of Arts in Psychology (M)

**Session H-9**

Biological and Agricultural Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**522 1:00 pm 55**

MutL loss in ER+ breast cancer alters secretome resulting in pro-tumorigenic macrophage polarization

Megha Raghunathan, Ph.D. in Biomedical Sciences (D)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

**523 1:00 pm 56**

Raf Kinase membrane activation is modulated by multivalent protein-lipid interactions

**Andres Jimenez Salinas, Doctor of Philosophy Chemistry/Biochemistry (D)**

**524 1:00 pm 57**

Chemical leachates from microfibers perturb embryonic development in zebrafish

**Angus Fletcher, MS: Environmental Health (M)**

**525 1:00 pm 58**

Non-targeted Analysis for Chemical Contaminants in Sediment near cannabis farms within Carpenteria county

**Alex Lee, Masters Public Health - Environmental Health (M)**

**526 1:00 pm 59**

Characterizing the Bacteroidales injection system from a human gut bacterium

**Josefa Rivera Alfaro, Masters of Science in Cell and Molecular Biology (M)**

**527 1:00 pm 60**

Identifying the mode of microbial origin of black spot disease in sea urchin *Lytechinus pictus*

**Jenna Luc, Cell and molecular biology, Microbiology (M)**

**528 1:00 pm 61**

Improving Training Data for Machine Learning-Based Protein Function Prediction Tools

**Sean Fahey, MS Bioinformatics and Medical Informatics (M)**

**Session H-10**

Engineering and Computer Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**529 1:00 pm 62**

Microbial abundance in response to varied waste introduction methods in onsite sanitation systems

**Lilith Astete Vasquez, PhD Engineering Sciences (D)**

**530 1:00 pm 63**

Effects of physical properties and binder chemistry on mechanical behaviour, and biocompatibility of hydroxyapatite bioceramic scaffolds using binder jet 3D printing

**Maryam Ghorbani, Joint Doctoral Program in Mechanical Engineering (D)**

**531 1:00 pm 64**

Investigation into Alternative Methods of Binder Injection in Binder Jetting

**Zackary Skinner, PhD in Mechanical and Aerospace engineering science (D)**

**533 1:00 pm 66**

Fundamental Investigation and Electrical/Electrochemical Characterizations of Glassy Carbon-Based Solution-Gated Field Effect Transistors

**Veronica Zanahuria Santana, Master of Science In Bioengineering (M)**

**534 1:00 pm 67**

Preliminary Assessments of Cigarette Filter Properties

**Eric Wilkinson, Master of Science in Mechanical Engineering (M)**

**Session H-11**

Health, Nutrition, and Clinical Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**535 1:00 pm 68**

HIV-Related Stigma and Distance to Care in Uganda

**Elsa Ghebrendrias, Joint Doctoral Program-Global Health (D)**

**536 1:00 pm 69**

Exploring WNT promoted chromosome missegregation in human pluripotent stem cells

**Sakshi Pradhan, Master's In bioinformatics (M)**

**537 1:00 pm 70**

Nutrition Composition and Flavor Profile of Chia Seeds

**Marta Carrillo, Master in Nutritional Sciences (M)**

**538 1:00 pm 71**

A Critical Analysis of Metformin & Physical Activity in Prediabetes

**Amu Darya, Masters of Science in Nursing (M)**

**539 1:00 pm 72**

Training Elders Against Hypertension (TEAH) Initiative

**Kenya Benitez, Master's of Public Health (M)**

**540 1:00 pm 73**

Does the Self-Reported Healthcare Access and Health Literacy Predict Concussion Care Seeking?

**Annaliese Andersen, Masters of Science in Athletic Training (M)**

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**541 1:00 pm 74**

Community-Based Human Papillomavirus Vaccine Education

Kacie Wass, Masters of Science in Nursing Leadership (M)

**542 1:00 pm 75**

The Effect of Hands-on Cooking Classes on SDSU Student's Ability to Navigate Barriers to Cooking Healthy

Melanie Reilly, Master of Public Health (M)

## Friday, March 1, 2024

### Session I: Poster Presentations

#### Session I-1

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Behavioral and Social Sciences 1

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**543 3:00 pm 1**

Indigenous Agroforestry and Fire Management in Thailand and the United States

Joaquin Rafael Ramoso, Bachelor of Arts in Interdisciplinary Studies (Sustainability, Political Science, Psychology) (U)

**544 3:00 pm 2**

Pandemic-Related Disruptions to Childcare and English-Spanish Bilingual Language Acquisition

Melisa Gonzalez, Bachelor of Arts in Psychology (U)

**545 3:00 pm 3**

The Role of Socioeconomic Factors on the Effectiveness of an Integrated Care Intervention among Latino Adults: the LUNA-D study

Rivera Adriana, Bachelors of Arts in Psychology, minors in Counseling and Social Change, Child and Family Development (U)

**546 3:00 pm 4**

Who am I? American Indian Youth

Jonathan Zepeda Rodriguez, Bachelor of Science in Criminal Justice (U)

**547 3:00 pm 5**

Investigating Processing Speed in Aphasia

Elizabeth Brownlee, Speech, Language, and Hearing Sciences (U)

**548 3:00 pm 6**

Cervical Cancer Screening Interventions for Indian Women Living With HIV

Brianna Hostler, Bachelor of Arts in Psychology (U)

**549 3:00 pm 7**

The Relationship between Cerebral Blood Flow and Language Impairment in Developmental Language Disorder

Alicia Linsky, Speech, Language, and Hearing Sciences (U)

#### Session I-2

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Behavioral and Social Sciences 2

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**550 3:00 pm 8**

Cross-linguistic Interactions in Bilinguals During Word Retrieval: A Cognate and Noncognate Production Study

Erica Axtell, Bachelors of Arts: Speech, Language, and Hearing Sciences (U)

**551 3:00 pm 9**

Campus Access Fear Mapping

Flor Calimag, Criminal justice (U)

**552 3:00 pm 10**

Thirdhand Smoke in Homes: Fate, Characterization, and Remediation

Oscar Lopez, Computer science (U)

**553 3:00 pm 11**

A Tale of Two Buildings: Do Smoking Policies Impact Discarded Waste from Commercial Cigarettes, E-Cigs, and Cannabis?

Maria Christina Huerta-Avila, Bachelor of Arts in Psychology (U)

**554 3:00 pm 12**

Can community gardens effectively address food insecurity? A Geographic exploration of disparities in garden capacity

Yasmeen Wael Zubaidi, Bachelor in Urban Studies (U)

**555 3:00 pm 13**

The Power of Support-Giving Increases Risk Perceptions of Alcohol Consumption

Andrea M. Chavira, Bachelor of Arts in Psychology (U)

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**556 3:00 pm 14**

More than Soil: Digging Deeper Into the Relationships of Space, Equity, and Policy of Urban Agriculture in San Diego, CA

**Cameron Schilling, Bachelor of Science in Environmental Science (U)**

**557 3:00 pm 15**

Trends in Responses and Recruitment in an Ecological Momentary Assessment Trial Among LGBTQ+ Adolescents Who Use Tobacco, Nicotine, and Cannabis

**Aona Shigemori, Bachelor of Science in Public Health (U)**

**Session I-3**

Biological and Agricultural Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**558 3:00 pm 16**

Plant root exudate carbon and nitrogen increase with root mass and can vary among plant families

**Lydia Duran, Bachelor of Science in Biology with an emphasis in Ecology (U)**

**559 3:00 pm 17**

Transposon mutagenesis strategy to discover lipopolysaccharide mutants

**Shivani Mahesh, Bachelor of Science in Biology - emphasis in Cellular and Molecular Biology (U)**

**560 3:00 pm 18**

Mechanistic Insights into Bordetella atropi Resistance in Wild Nematodes

**Dylan Matloub, Biology: Emphasis in Cell/Molecular (U)**

**561 3:00 pm 19**

Histological Assessment of Vaping-Induced Cardiopulmonary Injury

**Sophie Rokaw, Bachelor of Sciences, Biology (U)**

**562 3:00 pm 20**

Growth kinetics analysis and biochemical composition characterization enable smart culturing of nutritious freshwater *Chlorella vulgaris* biomass to enhance space food

**Nicole Romero, Bachelor of Science in Biology (U)**

**563 3:00 pm 21**

Determining the Impact of Fibulin 3 on CA19-9-Mediated Pancreatic Ductal Adenocarcinoma Growth, Invasion, and Cell Signaling

**Kassidy Curtis, Bachelors of Science in Cellular and Molecular Biology, Minor in Chemistry and Minor in Interdisciplinary Studies (U)**

**564 3:00 pm 22**

Role of Syncytiotrophoblast-derived extracellular vesicles in providing potential biomarkers for preeclampsia

**Giselle Adeline Cunanan, Bachelor of science in microbiology with an emphasis in clinical laboratory science (U)**

**Session I-4**

Education

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**565 3:00 pm 23**

Soy de Aquí y Soy de Allá: Exploring Transfronteriza College Students' Sense of Belonging at the Imperial Valley-Mexicali Borderlands

**Alexia Reyes, English (U)**

**566 3:00 pm 24**

Examining the Interaction Between Teachers and their Students in Head Start Classrooms

**Victoria Rietz, Bachelor of Science in Child Development & Bachelor of Arts in Journalism with an Emphasis in Media Studies (U)**

**567 3:00 pm 25**

Predictors of accuracy in Spanish reading comprehension in bilingual school-aged students

**Lilly Arellano, Speech, Language, and Hearing Sciences (U)**

**568 3:00 pm 26**

The Impact of Spatial Skills in a Mid-Major Computer Science Course

**James Marsh, Computer Science (U)**

**569 3:00 pm 27**

Light in the Darkness: Education for Afghan Women

**Wahida Hamdard, ISCOR (U)**

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**570 3:00 pm 28**

Exploring Educational Perspectives: A Study on Latine Students' Academic Performance Factors in High Schools

**Dennisse Bell, Interdisciplinary Studies in Three Departments (U)**

**571 3:00 pm 29**

Critical analysis of an undergraduate minor: curriculum alignment for the multicultural learning and working environment

**Shaye Phung, Bachelor of Arts in Liberal Studies (U)**

**59 3:00 pm 72**

The Henrietta Goodwin Scholars Program and its Influence on Academic Success among African American Students at San Diego State University

**Christaysha McDowell, Bachelor of Arts in Psychology (U)**

**Session I-5**

Behavioral and Social Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**572 3:00 pm 30**

Social support and cancer screening completion among patients in a Federally Qualified Health Center in San Diego, California

**Kiria Gabriela Fraga, Joint Doctoral Program in Health Behavior (D)**

**573 3:00 pm 31**

Combining ApoE Status and Olfactory Performance Predicts Alzheimer's Pathology Biomarkers

**Conner Frank, PhD Clinical Psychology (D)**

**574 3:00 pm 32**

Building Resilience to Climate Change Impacts through Community Engagement in Water Management: A Comparative Study of California and Baja California

**Andrés Peñalosa Reyna, Masters of Arts in Geography (M)**

**575 3:00 pm 33**

The Association Between Acculturation, Screen Media Use, and Body Appreciation among Latina Preadolescents

**Athena Cisneroz, Masters of Arts in Psychology (M)**

**576 3:00 pm 34**

A Drosophila Genetic Screening Platform to Identify Conserved Factors that Influence Biological Outcomes Following Traumatic Brain Injury Exposure

**Jesse Rojas, Masters of Science in Cell and Molecular Biology (M)**

**577 3:00 pm 35**

Mindfulness and Well-being in Asian Americans and Parents

**Sooji Kim, Child Development (M)**

**578 3:00 pm 36**

Population Distance in Lower Rio Verde, Oaxaca

**Abilene Ayala, Master of Arts in Anthropology (M)**

**Session I-6**

Biological and Agricultural Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**579 3:00 pm 37**

Coordination of the NF- $\kappa$ B and Notch signaling pathways in supporting ovarian cancer relapse

**Gregory Jordan, Cell and Molecular Biology/Doctor of Philosophy (D)**

**580 3:00 pm 38**

Drug transporter knockout and gut microbiome analysis in *Lytechinus pictus*: Building a model for commensal interactions and disease mechanisms

**Lauren Stoeltje, Cell and Molecular Biology (M)**

**581 3:00 pm 39**

Preserver of Reproductive Integrity: ABC transporters and their role protecting the germline

**MTimothaus Haddad, Masters of Biological Science (M)**

**582 3:00 pm 40**

Environmental Impacts of Emerging Tobacco Products as Litters

**Ashley Chang, Masters of Science in Public Health with a concentration in Environmental Health (M)**

**583 3:00 pm 41**

Interactions Between Bacteriophages and Phagocytes

**Allison Hedin, Masters of Sciences in Cellular and Molecular Biology (M)**

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**584 3:00 pm 42**

Determining the resistance of coast live oak (*Quercus agrifolia*) dominated forests in San Diego County to outbreaks of *Phytophthora* pathogens

**Fortunato Rivas, Masters of Science in Biology, Ecology Concentration (M)**

**585 3:00 pm 43**

The role of ChrY in human microglia and neurodevelopment

**Jessica Esparza, Masters of Microbiology (M)**

**586 3:00 pm 44**

Alzheimer's Disease DNA Barcoding

**Sol Diaz, Master of Science in Physiology (M)**

## Session I-7

Health, Nutrition, and Clinical Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**587 3:00 pm 45**

A Mixed Methods Study on the Need for Gender-Responsive (GR) Drug Services in Tonga

**Mele'ana Akolo, PhD Interdisciplinary Research on Substance Use (D)**

**588 3:00 pm 46**

Assessing the role of social support as a buffer against bias-based bullying and depressive symptoms among Latinx adolescents

**Alana Lopez, JDP in Public Health (D)**

**589 3:00 pm 47**

The influence of the microbiome on metabolic changes in Chagas disease

**Luis Ernst, Chemistry - Biochemistry (D)**

**590 3:00 pm 48**

A review of registered breast cancer clinical trials and mortality using the Surveillance, Epidemiology, and End Results (SEER) program from 2006-2020

**Kevin Nugent, Masters of Science in Epidemiology (M)**

**591 3:00 pm 49**

Evening Chronotypes are at Higher Risk of High Sugar Consumption due to Greater Sweet Taste Preference

**Katie Williams, Masters in Nutritional Sciences (M)**

**592 3:00 pm 50**

Effects of Postnatal Choline Supplementation on Lipid Profiles and Liver Function Markers in Alcohol-Exposed Sprague Dawley Rats

**Meghen Bishop, Masters in Nutritional Sciences (M)**

**593 3:00 pm 51**

Empowering Women's Well being: A Comprehensive Approach to Social Health Disparities

**Maria Fernanda Carrillo Escarcega, Master of Science in Big Data Analytics (M)**

**594 3:00 pm 52**

Exploring Secondhand Exposure to Vaping: A Dyad Study Using Wristband Nicotine and Urinary Cotinine

**Samantha Suess, Masters of Public Health in Epidemiology (M)**

## Session I-8

Education

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**595 3:00 pm 53**

A Case Study: Comparing Instruments in Chemistry Education and Mathematics Education with Coding Scheme

**Ruo Ning Qiu, Ph.D. in Mathematics and Science Education (D)**

**597 3:00 pm 55**

Inclusive English Language Development Practices in the Classrooms for English Language Learners at the Imperial Valley Borderlands

**Isua Camarena, Teaching Credential (M)**

**598 3:00 pm 56**

My Building Bridges Graduation Experience: A Photovoice Autoethnography Exploring the Right to Celebrate Graduation at the Imperial Valley-Mexicali Borderlands

**Andrea Van Bebber, Master in social work (M)**

**599 3:00 pm 57**

A Personalized Chatbot for Addressing Child Malnutrition

**Surbhi Sawant, Big Data Analytics (M)**

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## Session I-9

Business, Economics, and Public Administration

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**600 3:00 pm 58**

Commuter Mapping Research

**Natalia Rosales, Undergraduate (SD) Political Science Major  
Political Science Pre-Major Geological Sciences Major  
Lesbian, Gay, Bisexual, Transgender, Queer, and Plus Studies  
Minor (U)**

**601 3:00 pm 59**

Why California needs to lower its taxes?

**Ayoob Abed, Bachelors of Science in Finance (U)**

**602 3:00 pm 60**

Houseless Mapping Abstract

**Emily Hernandez Rincon, Psychology w/ Emphasis in  
Neuroscience (U)**

**603 3:00 pm 61**

Binational Planning of The World Design Capital: San Diego-Tijuana

**Gianna Salazar, Bachelors of Arts in Public Administration,  
Emphasis in City Planning (U)**

**604 3:00 pm 62**

Medical Question and Answering Review

**Kristen Waterford, Biology/Bachelor of Science (U)**

**605 3:00 pm 63**

Investigating Power Loss and its Impact on Disadvantaged Communities

**Arvin Domier, Master of Business Administration (M)**

## Session I-10

Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**606 3:00 pm 64**

Fear Embodied: Transforming Temor into Resistance Along the Borderlands

**Aurora Valdez De La Torre, Master's in Women's Studies (M)**

**607 3:00 pm 65**

Flora and Fauna Lexical Indicators for Prehistoric Movement of Yuman Peoples

**Jill Van Wormer, Master of Arts in Linguistics (M)**

**608 3:00 pm 66**

The Experiences of Autistic Adults in the Workplace: Characterizing Disclosure, Accommodations, and Job Termination

**Justice Herrera, Psychology (U)**

**609 3:00 pm 67**

Madeline Miller: "The Song of Achilles" & "Circe"

**Kristen Rivera, Bachelor of Arts in Applied Arts and Sciences (U)**

**610 3:00 pm 68**

Life is Just a Bowl of Post-Racialism: The Black Discourse of Julia

**Jose Ramos Alonso, Bachelor of Science Emphasis in Critical Studies (U)**

## Session I-11

Visual and Creative Arts

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**611 3:00 pm 69**

105 Miles from Home: Unveiling Operation Pedro Pan in a One-Act Play

**Alexis Hernandez, Bachelor/Liberal Studies with an Emphasis in Elementary Education Major and a Theatre Arts Minor (U)**

**612 3:00 pm 70**

Tranquil Hub: Crafting Calm in Contemporary Design

**Kerry McEachern, MFA in Visual Arts and Graphic Design (M)**

**613 3:00 pm 71**

Dramaturgy in Video Games - Playing with Accuracy and Humanity

**Dean Vicedo, Masters of Arts in Theatre Arts (M)**



## Visual Arts Exhibits

Friday, March 1, 2024

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### Sessions J

Exhibitors are required to stand by their presentations during the entire 1-hour and 30 minute discussion period.

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## Friday, March 1, 2024

### Session J: Visual Arts Exhibits

#### Session J-1

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Visual Arts

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**700 11:00 am Exhibit 1**

Holy Smokes

**Molly Fitzgerald, Bachelor of Fine Arts (U)**

**701 11:00 am Exhibit 2**

For Shirley

**Anisa Prom, English (U)**

**702 11:00 am Exhibit 3**

No More Brownfields: Branding for Community Outreach

**Kieran Gomez-Rodriguez, Art, Emphasis in Graphic Design (U)**

#### Session J-2

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Visual Arts

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**703 3:00 pm Exhibit 1**

Please Touch the Art! How Costume Technology Can Create Inclusive “Touch and See” Experiences

**Sabrina Soto, Theatre Arts with an Emphasis in Design and Technology (U)**

**704 3:00 pm Exhibit 2**

The Personal Aesthetics of Memory and Mood

**Jonathan Rodley, MFA Painting, Printmaking (M)**

**705 3:00 pm Exhibit 3**

I Asked AI (1-6)

**Marinta Skupin, MFA Art (M)**



## **Performance and Film Presentations**

**Friday, March 1, 2024**

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### **Sessions K**

Each performance/film presentation is allotted 20 minutes followed by a 5-minute question and answer period. Presenters are also allotted 5 minutes for setup. Participants and guests are asked to enter or leave the rooms only between presentations.

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## Friday, March 1, 2024

### Session K: Performance and Film Presentations

#### Session K-1

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Performance Arts

**Friday, March 1, 2024 9:00 am**

Montezuma Theater

**7 9:05 am**

Tina Tina Bo Bina

Jessica Ebert, Television, Film, and New Media Production (U)

**8 9:35 am**

Clones

Mark Heine, BSBA in Information Systems (U)

**9 10:05 am**

Overcoming

Reed Funes Smith, MFA In Film and Television Production (M)

**10 10:35 am**

The With;OUT Dance Project: Community Dancemaking

Robert Taylor, Masters of Arts in Liberal Arts and Science (focus in Dance, Queer, and Somatic Studies) (M)

#### Session K-2

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Performance Arts

**Friday, March 1, 2024 1:00 pm**

Montezuma Theater

**11 1:05 pm**

Here With You

Emily Deskin, Bachelor of Fine Arts in Dance (U)

**12 1:35 pm**

Sync or Swim

Arwyn Higgins, Dance (U)

**13 2:05 pm**

Dancing Beyond Boundaries: Exploring Rules, Class Disparities, and Identity in Ballet and Breaking  
Chasle Schoettle, Dance & Kinesiology Pre-PT (U)

**14 2:35 pm**

Entremedio/ In between

Alyssa Moreno, Bachelor of Fine Arts in Dance (U)



# Abstracts of Presentations

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## Session A

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## Session A-1

Oral Behavioral and Social Sciences

Friday, March 1, 2024 9:00 am

Legacy Suite

### 100 9:05 am

#### No Academia without AI: Decoding College Student's Perceptions of Artificial Intelligence

**Emily Mooney, Bachelor of Arts in Communication (U)**

This paper uses in depth interviews with college students to examine perceptions of Artificial Intelligence (AI) and how these perceptions affect AI engagement in academic settings. Grounded in Cultivation Theory and Mean-World Syndrome, this research aims to identify ways in which AI can be utilized positively within educational contexts. Additionally, the study aims to provide valuable insights for policy improvements in AI related resources at San Diego State University, specifically pertaining to career services. This study utilized a convenience sample of four student (n=4) participants with AI experience. Throughout the research process, qualitative interviews were conducted and coded thematically. From the data collected, it is apparent that college students hold negative perceptions surrounding heavy reliance on AI, with ideas of “cheating,” “deceiving,” and being “scary,” occurring regularly. Additionally, college students value use of AI as a tool for guidance. This paper follows an iterative analysis approach to explore the theoretical relationship between Cultivation theory and these findings.

### 101 9:25 am

#### Suicide Risk Factors and Types of Intersectional Discrimination Among Sexual and Gender Minority Youth at Risk for Repeat Suicide Attempts

**Shefali Sharma, Bachelors of Arts in Psychology with an Emphasis in Neuroscience (U)**

##### Background

Young sexual and gender minorities (SGM) are at a higher risk for suicide attempts compared to their heterosexual/cisgender peers. Research in predominantly racial/ethnic minority populations suggests that intersectional discrimination (e.g., based on intersecting minority identities) may exacerbate key suicide risk factors purported in the interpersonal theory of suicide. Yet, less is known about these associations among young SGM with other intersecting identities. Therefore, this study explores whether higher levels of intersectional discrimination are associated with higher levels of acquired capability for suicide, perceived burdensomeness, and thwarted belongingness and lower levels of internal and external suicide-related coping skills in SGM youth and young adults at risk for repeat attempts.

##### Methods

Seventy-one diverse SGM (aged 15-29 years; 49% racial minority, 35% ethnic minority) with a history of one or more suicide attempts and current suicidal ideation were recruited

for a suicide prevention trial in San Diego, CA, providing baseline self-report data. Measures included the Intersectional Discrimination Index (InDI), with subscales for anticipated (InDI-A), lifetime day-to-day (InDI-D), and lifetime major discrimination (InDI-M), as well as Acquired Capability for Suicide Scale (ACSS), Suicide-Related Coping Scale, and Interpersonal Needs Questionnaire (INQ-15). Five separate linear regression models explored whether the InDI subscales predicted suicide risk factors while controlling for age.

##### Results

The models accounted for a substantial proportion of variance in perceived burdensomeness ( $R^2=.19$ ) and acquired capability for suicide ( $R^2=.24$ ). Higher scores on InDI-D, but not on other subscales, were related to higher perceived burdensomeness [ $\beta_1=6.89$ ,  $t(df=66)=3.89$ ,  $p < .01$ ]. Higher scores in InDI-D, but not other subscales, also were related to higher acquired capability [ $\beta_1=4.27$ ,  $t(df=66)=5.39$ ,  $p < .01$ ]. InDI subscales were not significantly associated with internal and external suicide-related coping skills or thwarted belongingness.

##### Discussion

Lifetime exposure to day-to-day discrimination may be linked to perceived burdensomeness and acquired capability for suicide in SGM youth and young adults, but not other types of intersectional discrimination or suicide risk factors. Suicide prevention efforts may benefit from targeting coping with lifetime day-to-day discrimination to mitigate key risk factors underlying suicide.

### 102 9:45 am

#### Fear Mapping

**Emily Brown, Bachelor of Science in Environmental Engineering (U)**

##### Problem

How do people view their world in terms of safety? What areas stand out? These, and many other questions, are what we worked to address by having individuals draw cognitive/image maps of the SDSU campus environment.

##### Research Strategy

In response, this research reports the findings of human-centered cognitive/image mapping exercises with houseless individuals in San Diego and Los Angeles, based on principles outlined in Kevin Lynch's “Image of the City” (Lynch, 1960). Specifically, this study asked individuals to draw maps (on blank pieces of paper) of their surroundings and daily routines at SDSU, which were then marked with symbols to identify important locations. We then had them mark the important locations on printed maps so we could then geo-code this information.

##### Findings

From our review, we have found that there are gender differences in how people view the safety of the SDSU campus environment. This speaks to the need for better design and security to create a safer campus environment.

##### Takeaways for Practice

This work can ultimately help promote better quality of life for

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individuals by improving the design and planning for creating a campus environment that feels safer and more secure.

### 103 10:05 am

Sustainability as a tool for slum mitigation in the Indian subcontinent, Latin America, and Sub-Saharan Africa

**Alisson Ruballo Jimenez, Bachelor/International Security and Conflict Resolution (U)**

A determining factor of quality of life that is prevalent cross-globally is the degree of environmental robustness and availability of vital commodities within a region. These lay the foundation for societies to build upon. However, these elements are disproportionately low or wholly absent within densely populated, impoverished urban areas— also known as slums— and have become an increasingly large and all-encompassing crisis within our global society. According to the United Nations, more than half of the global population is currently living in an urban area, and approximately over a billion of those individuals are living in a slum or a slum-like environment (“United Nations SDG Goals”). Thus, the topic of proper urban development is critical due to its egregious impact on the quality of life for a considerable amount of the world population.

This paper will delve into the factors that characterize slums, conduct an overview analysis of three geographical areas (Indian subcontinent, South America, and Sub-Saharan Africa) that continually confront this issue, analyze its subsequent implications— like disease and public health risks, poor infrastructure and economic development, social-political disenfranchisement— and finally review how these come into interaction with sustainability and the environment’s health. I will conclude my research by establishing a pattern of correlation between improper urban development and the aforementioned points, and propose intentional, long-term solutions that set the precedent for prioritizing human quality of life and environmental protection.

How does sustainable urban planning provide the necessary elements for the proper development of human societies and eradicate the issues brought on by slums? How can it take into consideration the improvement of the environment’s quality and incorporate more restorative practices (e.g. clean water restoration, sustainable housing, community gardens) and to what degree does it help reverse the effects of harmful environmental phenomena like the global climate crisis? These questions will aid in addressing tangible global examples with specific concern to public health, economics, and political science. Ultimately, I will draw on the literature to find solutions relevant to these concerns while prioritizing sustainable urbanization.

### 104 10:25 am

The unique effect of neglect on trajectories of speech problems in youth

**David Straub, Post-bac (U)**

INTRO: The dimensional model of adversity and psychopathology suggests that experiences of victimization

and neglect differentially affect youth development (McLaughlin et al., 2014). In particular, neglect is thought to uniquely impact language development via lack of cognitive input. However, very little research has explored this question longitudinally. METHODS: The current study examined the association between neglect and victimization and trajectories of speech problems across childhood and early adolescence among 1,352 parent-child dyads from Longitudinal Studies on Child Abuse and Neglect (LONGSCAN). Repeated measures data were collected during six biannual interviews across children’s ages 4-14 years; children’s cumulative victimization was captured by aggregating self-reports, caregiver-reports, and CPS allegations of experiencing and/or witnessing violence between each interview. Neglect was defined dichotomously by the presence of an official CPS allegation between each interview. Child speech problems were assessed at each interview using a single caregiver-reported questionnaire item. RESULTS: Latent growth curve modeling revealed that speech problems declined on average over the course of the study, with a steeper decline in childhood compared to adolescence. Neglect between ages 0-4 was associated with increased speech problems at age 4 and a slower decline thereafter; victimization was not associated with trajectories of speech problems, nor with speech problems at any individual time point. DISCUSSION: Our findings suggest that early neglect may have crucial short- and long-term impacts on the development of speech problems. Victimization by violence, which can be detrimental across several developmental domains, may not exert as strong an influence on children’s communication relative to deprivation-related experiences.

REFERENCES:

McLaughlin, K. A., Sheridan, M. A., & Lambert, H. K. (2014). Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neuroscience & Biobehavioral Reviews*, 47(47), 578–591. <https://doi.org/10.1016/j.neubiorev.2014.10.012>.

### 105 10:45 am

Does ChatGPT Write Reviews that are Human-Like, Trustworthy, and Convincing, According to Readers?

**Emily McHale, Linguistics and Spanish (SST) (U)**

This research and pilot study on the subject of how readers perceive the humanness, trustworthiness, and convincingness of film reviews written by humans versus film reviews generated by ChatGPT analyzes how participants rated various human and generated reviews, taking into account free response answers asking for justification of participant ratings.

Research was compiled from sources discussing systems such as ChatGPT that use large language models’ limitations, primarily in relation to their inability to create meaning from form alone. Other research, including studies regarding whether participants mistake generated responses for human responses, and whether they prefer generated responses to human responses, was compiled. Within these studies, evidence suggested that participants tended to prefer generated responses because they were longer, contained more

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first-person pronouns, and sounded more empathetic.

The pilot study had mixed responses as to whether participants believed generated or human-written film reviews to be more human-like, trustworthy, and convincing. Within the free responses, participants explained that certain elements of the language within generated and human reviews led them to answer how they did.

## Session A-2

Oral Engineering and Computer Science

Friday March 1, 2024 9:00 am

State Suite

### 106 9:05 am

Quantum Algorithm for Resolving the Prisoner's Dilemma via Nash Equilibrium

**Tanner Kocher, Bachelor of Science in Computer Science (U)**

In the realm of game theory, the Prisoner's Dilemma has long served as a paradigm for analyzing strategic interactions. Recent research has shown promise in the study of Quantum Game Theory, employing the computation power of Quantum Computers to find Pure Nash Strategy Equilibrium. In this research, we present a solution to the prisoner's dilemma found through a Quantum Algorithm. In general, the research delves into the fascinating intersection of Quantum Computing and Game Theory. It proposes innovative strategies for resolving the inherent challenges presented by games, such as, the Prisoner's Dilemma. We explore how quantum strategies, enabled by the unique properties of qubits, offer novel perspectives on cooperation and competition. The talk navigates the intricate landscape where classical strategies fall short and quantum processing emerges as a game-changer. The Quantum Algorithm leverages the power of entanglement in order to simulate all outcomes of the game simultaneously. This provides a dramatic decrease in the number of operations needed to find the Pure Strategy Nash Equilibrium. Results obtained from experiments utilizing a Quantum Computer demonstrate significant promise, establishing it as a compelling avenue for research into studying Quantum Game Theory.

### 107 9:25 am

Analysis and Interpretation of VLA RFI Monitoring Data From the SpaceX Pilot Installation

**Erik Chavarin, Bachelor of Science in Electrical Engineering (U)**

During the spring and summer of 2022, 59 SpaceX Starlink user terminals (UTs) were installed to the northeast of the Karl G. Jansky Very Large Array (VLA) at the Alamo Navajo Reservation. Since then, standardized monthly observations of a field containing weak radio sources have been conducted to measure the impact that Starlink downlink (space-to-Earth; 10.7--12.7 GHz) and uplink (Earth-to-space; 14.0--14.5 GHz) radio frequency signals have on calibrated, pipeline-processed VLA interferometric images. Between March and June 2022,

observations using the A configuration of the VLA were taken biweekly during UT installations. As of July 2023, these observations span an entire VLA configuration cycle, providing a full characterization of the impact across all possible VLA baselines. This project measures and analyzes the impact of Starlink signals on imaging both before and after UT installations and demonstrates that VLA imaging is currently not severely impacted by this installation in terms of image RMS noise and flagged data percentage. With the existing datasets, this project also extends its analysis to include the examination of Starlink downlink transmissions illuminating the main lobe of the VLA in its D configuration, in conjunction with Starlink ephemerides. This project will maintain ongoing spectrum monitoring as the Starlink megaconstellation proliferates and more UTs are installed.

### 108 9:45 am

Investigating the Environmental Fate of Marine Debris: Insights from Outdoor Exposure Experiments and Tumbling Simulations

**Alexi Olney, Bachelor of Science in Statistics with an emphasis in Data Science, Minor in Environmental Engineering (U)**

This study is motivated by the substantial contribution of rivers to marine debris, particularly exacerbated during Southern California storm events, emphasizing the need to understand the influence of environmental exposure on debris fragmentation and river export dynamics. Physical characteristics, including buoyancy, density, thickness, and mass, for ten of the most common marine debris types found along river margins (all of which, incidentally, were composed of plastic polymers), were assessed both before and after 9-months of exposure to outdoor conditions in wet, submerged, and dry environments. These experiments revealed that wet conditions induced more pronounced density changes across all debris samples and fostered the growth of biofilm that protects against photobleaching. Under dry conditions, polymer thickness had a greater influence on fragmentation than polymer type. For example, the medical mask (polypropylene) and thin plastic bag (LDPE) were subject to extreme fragmentation whereas the thick plastic bag (also LDPE) remained mostly intact. To simulate the additional fragmentation that might occur during debris transport in river systems during a storm event, we conducted mixing and abrasion experiments using both pristine and 9-month-weathered plastics. Post-tumbling analysis revealed that styrofoam (polystyrene), bioplastic to-go boxes (polypropylene + calcium carbonate), and medical masks (polypropylene) from the dry environment exhibited the highest degree of fragmentation. Conversely, blankets (polyester), tents (also polyester), thick plastic bags (LDPE), water bottles (PET), and plastic to-go boxes (polypropylene) from both weathering conditions displayed the least fragmentation. These discoveries carry implications for comprehending degradation patterns in diverse environmental conditions and offer insights for formulating debris management strategies, such as trash cleanup initiatives and the design of efficient trash capture devices, ultimately aiming to mitigate the impact of marine debris on aquatic ecosystems.

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### 109 10:05 am

#### Utilization of fluorescence spectroscopy to track startup of plastic and rock media upflow bioreactors for anammox enrichment

**Polina Popova, Bachelors of Science in Environmental Engineering (U)**

Anaerobic ammonium oxidation (anammox) bacteria offers a low-cost alternative to conventionally applied methods for removal of nitrogen from wastewater. Wide-scale adoption of anammox remains limited due to its slow growth rate and difficult cultivation. Although previous research shows that monitoring of anammox activity and abundance in real-time using fluorescence spectroscopy can assist in dynamic operation of anammox reactors, specific anammox fluorescence features remain poorly understood. The present study aimed to characterize and compare changes in effluent dissolved organic matter (DOM) of two upflow anammox bioreactors containing plastic and rock biomass retention media via EEM (emission excitation matrix) fluorescence spectroscopy, while assessing anammox enrichment based on carbon and nitrogen species concentrations and stoichiometric relationships. Identical anaerobic reactors filled with plastic-media (PM) and rock-media (RM) operated for a total of 353d and 316d, respectively, under low-maintenance conditions with intermittent pumping of feed (pH ~7.0-7.5) containing ~100 mg NH<sub>4</sub>-N/L and ~120 mg NO<sub>2</sub>-N/L to achieve residence times of ~18 hours. Both reactors reached >95% removal of NH<sub>4</sub>-N and NO<sub>2</sub>-N by day 170-180, and stoichiometric NO<sub>2</sub>/NH<sub>4</sub> and NO<sub>3</sub>/NH<sub>4</sub> ratios were consistent with anammox metabolism. Correlation analysis showed several strong relationships between anammox enrichment and EEM data. Most notably, freshness index, a measurement of recently produced DOM, increased with ammonium removal and was significantly correlated (for PM, R=0.666, p > .0.01; for RM, R=0.850, p > 0.01). By contrast, Peak A, associated with production of humic acid-like substances by heterotrophic bacteria, had an inverse relationship to ammonium removal (PM, R=-0.849; RM, R=-0.867). Furthermore, there was an increase in the ratio of Peak F420 (previously linked to production of coenzyme F420 by methanogenic archaea) to humic Peak A that had a statistically significant correlation with nutrient removal in the PM reactor (R=0.914, p<0.01), but not in the RM reactor (R=0.344, p>0.05). Sequencing of microbial DNA from both reactors confirmed anammox presence and similar microbial consortia that lacked methanogenic archaea. Findings of the current study demonstrate that fluorescence indices track the enrichment of anammox bacteria.

### 110 10:25 am

#### Tensile Behavior of Density-graded Polyurea Elastomeric Foams

**Paul Kavvaka, Mechanical Engineering (U)**

Research into elastomeric polyurea foams developed novel impact mitigation mechanisms in different configurations and geometries. However, the contributions of the interfacing strategies on the overall mechanical behavior have been smeared by previous characterization approaches. This

project aims to explore the performance of ungraded and density-graded polyurea foams at quasi-static tensile loading scenarios using digital image correlation (DIC) measurements. Specifically, foam samples are extracted from large sheets previously fabricated in-house with different configurations: ungraded and bilayer and trilayer density-graded. The latter samples were assembled using an ultrathin layer of polyurea adhesive (adhered configuration) and based on the natural adhesiveness of the foam slurry (seamless interfacing). All samples were fitted with T-section tabs to facilitate installment in a 1 kN load frame for tensile testing. The lowest density layer was consistently located toward the fixed platen of the load frame. The macroscale and mesoscale strain fields were resolved using DIC, delineating the dichotomy of the deformation in the foam samples in relation to gradation and interfacing strategies. Analyses stipulate that the interfacing strategy plays a significant role in the failure response, resulting in a multiple-fold increase in strain-to-failure in graded structures compared to the ungraded counterpart. The full field deformation states as a function of gradation and interfacing approaches are synthesized and discussed. The outcomes of this research serve as a basis for extended exploration of the mechanical behavior of elastomeric foams for packaging and biomechanical impact mitigation applications.

## Session A-3

Oral Behavioral and Social Sciences 1

**Friday March 1, 2024 9:00 am**

Love Library 430

### 111 9:05 am

#### The construction of ideology in U.S. news reports: An exploration through grammar choices

**Samuel Massey, Masters of Arts in Linguistics (G)**

Having access to news media that contains unbiased information is important for the public to understand current topics. News articles are often considered to be a key source of unbiased information (Hamborg et al., 2017). Unfortunately, the issue of bias in the news media has become more prevalent. Public trust in mass media is at an all-time low as a result (Brenan, 2023). Studies in discourse analysis have shown the same events depicted differently from different sources (Abbas & Talaat, 2021; Lukin, 2005). These studies have shown that different reports of the same event manifest different world views or ideologies through their language choices. One topic that has received little attention is police violence against African Americans. The goal of this study is to explore ideological differences in the representation and coverage of George Floyd's death across different news outlets and to examine how the news reports police violence against Black Americans in the United States. Specifically, the study seeks to investigate if there is a difference in how the fatal incident was reported in conservative versus liberal news media outlets and if there is a difference in reporting between newspapers, tabloids, and news outlets. Six texts were selected to represent several politically diverse American newspapers, tabloids, and

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

news outlets: New York Times, Washington Post, Wall Street Journal, New York Post, Fox, and CNN. The news article dates corresponded to the initial days after the fatal incident. The analytic framework used was a transitivity analysis (Eggs, 2004), which explores the sorts of processes and participants used to report the death of George Floyd. Specifically, the study examined what information was foregrounded and whose words were represented in the news reports. The findings of the study suggest that the choices in processes and participants in each clause indicate that George Floyd's death is represented differently in the different news reports. Results suggest that news bias is manifested in what information is foregrounded and backgrounded in the articles as well as whose words get represented in the article.

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### 112 9:25 am

#### Deutsch or Mexicana: German Investment and Identity in Mexico during the Porfiriato

**Arturo Avalos, Masters of Arts in Anthropology (G)**

When attempting the role of Germans and their contributions towards Mexico, as well as the impacts these influences had on Mexican culture, it is important to contextualize the background of economic development during the Porfiriato. Originally arriving as merchants,

the Germans played a major role in the economic development of Mexico, primarily in Mexico City, where several families made their fortunes. This period in Mexico's history saw

the encouragement of much foreign investment towards Mexico, primarily French, as the

government of Porfirio Diaz was filled with Francophiles. However, during this time, German investors were vying for their chance at conducting business in Porfirio Diaz's rapidly modernizing Mexico. As Diaz was interested in Europeanizing the Mexican people combined with the lasting impact of the Spanish Casta-System, it became easier to understand

the circumstances which allowed for the Germans (and other Europeans) to monopolize the Mexican economy. At the same time, Germans were navigating their identities as both Mexican and German, which posed some challenges, especially towards their non-White counterparts. It is also important to understand the background of the world which allowed Diaz, his government, and the Germans and their government to become intertwined in the history of Mexico.

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### 113 9:45 am

#### Cognitive control dysregulation in young adult binge drinkers: behavioral indices and oscillatory neurodynamics

**Vanessa Thomas, Psychology (G)**

Binge drinking among young adults is a growing concern, with potential neurocognitive deficits contributing to the development of alcohol use disorders. Limited evidence exists on cognitive dysfunction in young binge drinkers, particularly in the context of cognitive control, which is vital for behavior regulation and known to be vulnerable to alcohol's effects. This study hypothesized that binge drinkers would demonstrate

poorer performance on a modified color-naming Stroop task and exhibit attenuated brain activity, characterized by lower theta power and weaker synchronous co-oscillations. Participants included 34 binge drinkers (BD) and 34 light drinkers (LD), matched on demographics, family history of alcoholism, and cognitive capacity. Their cognitive control was probed with a modified version of the color-naming Stroop task. The behavioral outcomes highlighted the Stroop interference (SI) effect across participants, with lower accuracy and longer reaction times on high- relative to low-conflict trials. BDs and LDs showed comparable accuracy, but BDs had slower reaction times, suggesting a compensatory strategy to maintain accuracy levels. Longer reaction times were associated with higher levels of alcohol consumption. Electroencephalography (EEG) signal was analyzed in theta frequency band (4 – 7 Hz) with Morlet wavelets. As expected, greater event-related theta power was observed on high-conflict trials overall during the controlled processing/response conflict resolution stage. However, BDs showed attenuated SI event-related theta activity compared to LDs over the left hemisphere, which was associated with higher drinking levels. Event-related synchronous co-oscillations were additionally calculated to estimate the consistency of phase differences in theta band irrespective of the neural activity amplitudes. Synchronous co-oscillations were stronger in the LD group and were associated with higher accuracy, shorter reaction times, and better cognitive functions. Conversely, lower long-range oscillatory synchrony correlated with higher levels of alcohol intake. The results confirm the initial hypotheses, revealing that binge drinkers not only underperformed in the Stroop task but also showed attenuated event-related theta power to SI and reduced synchronous neural interactions, indicative of compromised cognitive control mechanisms. These findings are suggestive of disrupted top-down strategic processing in BDs, which could contribute to poor self-control and inability to refrain from excessive alcohol consumption.

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### 114 10:05 am

#### Exploring ethnic identification's impact on Gen-Z Asian American beauty influencer marketing campaigns

**Jessica Arguelles, Mass Communications/MA (G)**

This study investigates how ethnic identification impacts Generation Z Asian Americans' response to sponsored beauty influencer content. Using Jenkins' (1994) Social Identity Theory as a framework, this study utilizes focus groups to examine how ethnically similar influencers impact Asian American consumers' perceptions of sponsored Instagram content. Through semi-structured focus groups with an intersectional lens, the study explores how ethnic identity affects participants' responses to sponsored influencer advertisements on Instagram. The sessions will include generative questions and two sets of stimuli paired with a demographic survey to account for potential patterns within similar Asian ethnicities or cultural upbringings. In doing so, this study aims to fill gaps in Asian American consumer research and contribute to inclusive marketing practices that accurately represent minority communities.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

### 115 10:25 am

#### Identifying key strategies for program sustainment in faith-based settings through promotora perspectives

**Melanie Gomez, Masters of Arts in Psychology (G)**

##### Background:

While evidence-based interventions (EBIs) designed to increase physical activity (PA) have shown to improve health outcomes, few programs have been sustained. This is especially true in faith-based settings where churches have limited resources, and staff face competing demands. Promotoras (i.e. community health workers) have a deep understanding of the needs and resources of their community. They play a crucial role in building trust between community members and outside institutions, as well as facilitating buy-in for EBIs. The current study aimed to identify key strategies for successful sustainment of a PA program in faith-based settings from the perspective of promotoras.

##### Setting/population:

Faith in Action is a promotora-led EBI designed to increase moderate-to-vigorous PA among churchgoing Latinas. Participants included Latina promotoras (n=10) who led the physical activity classes in churches.

##### Methods:

Research staff conducted, audio recorded, and transcribed 3 focus groups with promotoras. Transcripts are being analyzed using rapid qualitative analysis, summarizing data in templates based on the domains from the Public Health Program Capacity for Sustainability framework, such as funding stability, partnerships, and organizational capacity.

Coding discrepancies are being reconciled as a group. Summaries will be transferred into a matrix for topic monitoring to observe trends and reflect on patterns.

##### Preliminary results:

Preliminary results reveal themes identified in the Public Health Program Capacity for Sustainability framework such as political support, partnerships, and program adaptation. Promotoras identified several facilitators to program sustainment such as church leader support shown through endorsement of promotoras and the program, connections with other community organizations, and program alignment with community values and needs. Considerations for sustaining a PA program in church settings include hiring promotoras who are committed to supporting church members, and attaining explicit permission from the church for the promotoras to sustain the program after the university project has ended. Additionally, promotoras suggested additional training on delivering nutrition and PA information to participants, and problem solving for class disruptions.

### 116 10:45 am

#### Testing the feasibility of a prenatal yoga mobile app in African American pregnant women: The Mindful Maternity Study

**Destiny Akins, MS Nutritional Sciences (G)**

##### Introduction:

Maternal and infant health disparities among African American (AA) women is a major public health issue. AA women are three times more likely to die during childbirth, have two times the rate of infant mortality, and experience higher rates of poor mental health outcomes compared to White women. Practicing prenatal yoga via mobile may be a safe and effective way to improve the health and well-being of pregnant AA women, is convenient, and may increase access to care. However, a prenatal yoga mobile app has yet to be tested in this population. The purpose of this study is to investigate the feasibility of a prenatal yoga app in pregnant AA women.

##### Methods:

This IRB approved study is a single-arm mixed-methods feasibility study. Recruitment will begin in February 2024. Participants (N=50) will be asked to use a prenatal yoga mobile app for at least 20 mins/day, 3 days/week for 12 weeks and wear a free wrist-worn Garmin fitness tracker for the duration of the study. A baseline, mid, and post-intervention survey will collect primary and secondary outcome measures and self-reported birth outcomes will be collected post-delivery. Exit interviews will also be conducted to explore and identify cultural adaptations relevant for pregnant AA women. Participants will receive a free yoga mat and \$100 gift card.

##### Results:

50 participants will be recruited from local prenatal clinics and social media. Primary outcomes include feasibility measures (acceptability, demand, recruitment metrics, and barriers). Secondary measures include mental and physical health outcomes (discrimination, perceived stress, perinatal depression, self-awareness, mindfulness, physical activity, and birth outcomes). We hypothesize that the prenatal yoga intervention will be feasible and elicit positive mental and physical health changes but will need some cultural adaptations to align with the values/preferences/beliefs/needs of pregnant AA individuals.

##### Discussion:

The findings of this study will contribute to identifying accessible, culturally-tailored interventions to improve AA well-being and promote optimal maternal and infant health outcomes. Additionally, findings will contribute to future grant funding for a larger scale efficacy trial.

## Session A-4

Oral Behavioral and Social Sciences 2

**Friday, March 1, 2024 9:00 am**

Love Library 431

### 117 9:05 am

#### Exploring Multilevel Factors that Influence Physical Activity Among Latinos with Chronic Spine Pain

**Patricia Dionicio, Doctorate in Public Health - Health Behavior (D)**

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

### Introduction

Latinos are at an elevated risk for medical undertreatment of chronic pain due to having a lower socioeconomic status, inconsistent access to healthcare, limited English proficiency, and systemic prejudicial discrimination. Physical activity (PA) is a widely accepted and effective non-pharmacological pain management strategy, yet many Latinos do not engage in moderate-to-vigorous physical activity (MVPA). Latinos with chronic spine pain (CSP) face distinct challenges with engaging in MVPA that may be explained by factors at multiple levels of the socioecological model (SEM). These multilevel factors may also intersect to influence PA engagement in Latinos with CSP. The purpose of this study is to integrate the SEM and intersectionality framework to explore multilevel determinants of MVPA among Latinos with CSP.

### Methods

A purposive sample of Latinos with CSP (N=25) from an ongoing clinical trial will be invited to completed semi-structured interviews. Interviews will explore multilevel factors that influence PA engagement. Rapid Qualitative Analysis methods will be used to analyze transcriptions and identify themes. Intersectional framing of the data will be ensured by considering implicit themes of unequal PA opportunities due to social exploitation or injustice in social or historical contexts. Currently, 17 interviews have been conducted and 4 interviews have been analyzed by 2 separate researchers (PD, ADT, and MM).

### Implications

This study will be the first to integrate the socioecological model and intersectionality framework to explore determinants of MVPA in Latinos with CSP. Study findings hold potential to inform future PA interventions for Latinos with CSP that tailor strategies for the unique needs of this population with the ultimate goal of addressing PA disparities.

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## 118 9:25 am

### Bridging Gaps in Physical Activity Promotion: Adapting Faith in Action for Rural Latinas Using the IM-Adapt Framework

**Jackelyne Garcia, Doctorate in Clinical Psychology (D)**

Physical inactivity poses significant health risks, particularly among Latinas, with Latina women exhibiting lower engagement in leisure-time physical activity (PA) than Latino men. This disparity is further pronounced in rural Latina communities, where multifaceted barriers, such as limited access to resources, transportation challenges, adverse weather conditions, and cultural factors, contribute to heightened health risks. Faith in Action is an evidence-based, physical activity intervention tested in churches located in urban and suburban settings. Research is needed to examine the feasibility of implementing Faith in Action in rural settings.

### Methods

This study will enlist three Faith-Based Organizations (FBOs) from Imperial County, a rural community along the US-Mexico border. FBO leaders and two promotoras based on their FBO affiliation, personal interest in physical activity (PA), and availability to serve as program implementers to participate in

key informant interviews and complete surveys. Additionally, 10 Latina women, aged 18-65, with low self-reported leisure-time engagement, and residing in rural areas will be recruited to participate in focus groups and complete surveys. This study utilizes the IM-Adapt framework to tailor the Faith in Action program specifically for rural Latina settings, following a six-step process: (1) conduct a needs assessment and assess organizational capacity, (2) search for existing Evidence-Based Interventions (EBIs), (3) assess fit and plan for adaptations, (4) make adaptations, (5) plan for implementation, and (6) plan for evaluation on changes to the existing EBI.

### Expected Results/Implications

The study is likely to yield a tailored version of the Faith in Action program, specifically adapted for rural settings. Adaptations may involve adjustments to content, delivery methods, and engagement strategies to better suit the unique needs and challenges identified in the study. Findings will address a gap in research in rural settings, emphasizing the importance of cultural sensitivity and community collaboration in health promotion efforts.

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## 120 10:05 am

### Exploring Coparenting Strain and Outcomes Nicolé Mendoza, Masters of Arts in Sociology (G)

The increase in nonmarital births and cohabitation in recent decades, results in more parents having to grapple with complex coparenting relationships. These family changes have been made more complicated by factors such as incarceration, relationship complexity, mental health, and intimate partner violence (IPV). Traditionally, scholarship has documented the impact of various factors, such as IPV on coparenting, and increasingly, the challenges of paternal incarceration on coparenting. However, these streams are entirely separate. This project aims to look at stressors independently, and then examine their cumulative impact on the ability to successfully coparent.

I anticipated that experiencing one stressor would result in an adverse parenting relationship, but that experiencing multiple stressors would compound poor coparenting. Using data from the Future of Family and Child Wellbeing Study, I examine the impact that various stressors have on the ability to successfully coparent. I estimate a series of Ordinary Least Squares regression models to examine the impact that abuse, incarceration, relationship complexity (i.e. new partnerships and multipartner fertility), and poor mental health have on the ability to successfully coparent independently, and then holistically. There is very little research which looks at the cumulative impact of strain on the ability to successfully coparent. Thus, my research will actively work to bridge this gap, and work to analyze the relationship that various strains have on the ability to successfully coparent.

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## 121 10:25 am

### Puff Break: Protocol for Adapting Ecological Momentary Assessment Methods to Measure Factors Associated with Tobacco, Nicotine, and

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Cannabis Use among LGBTQ+ Adolescents in California

**Andrew Lim, Joint Doctoral Program in Public Health - Health Behavior Concentration (D)**

Background: LGBTQ+ adolescents report higher rates of tobacco/nicotine/cannabis use compared to their cisgender, heterosexual counterparts. Research using smartphone-based ecological momentary assessment (EMA) methods has underscored the impact of minority stress (e.g., discrimination) and socialization experiences (e.g., community norms) on tobacco/nicotine/cannabis use in LGBTQ+ adults, but not LGBTQ+ adolescents. To address this gap, we proposed a two-phase pilot study to adapt and implement an EMA protocol measuring the daily impact of minority stress and socialization on tobacco/nicotine/cannabis use in LGBTQ+ adolescents aged 14-19. The purpose of this abstract is to report on our protocol methods and recruitment to date.

Methods: In Phase 1, seventeen key informant and semi-structured interviews were conducted to inform modifications to existing validated measures for adolescent populations and EMA methods. In Phase 2, fifty adolescents will be recruited via flier distribution to community partner organizations, social media, and word of mouth. Additional inclusion criteria include: California residency; LGBTQ+ self-identification; and recent tobacco, e-cigarette, or cannabis use. Eligible participants complete a baseline survey capturing demographic information, tobacco/nicotine/cannabis use, and stress/socialization experiences. Subsequent participants will engage in a 14-day EMA trial responding to brief (<5 minute) assessments on their smartphones five times daily, along with regular meetings with staff to promote retention. Post-trial, participants complete an exit survey and semi-structured exit interview reflecting on their EMA data and informing future intervention development. Participants can receive a gift card up to \$175.

Analyses: Qualitative data will be transcribed and analyzed using rapid qualitative analysis to assess the acceptability, appropriateness, and feasibility of the EMA methods.

Descriptive analyses of quantitative EMA data will assess compliance using an 80% threshold. Multi-level modeling will estimate associations between stress and socialization exposures and tobacco/nicotine/cannabis use behaviors.

Results and Discussion: Seventeen participants have been enrolled to date. Challenges include the recruitment of 14-17-year-old participants and handling fake participants. Despite these challenges, current analysis of compliance, exit survey, and exit interview data indicate that the protocol has the potential to shape future behavioral interventions to address tobacco/nicotine/cannabis use among LGBTQ+ adolescents.

### 122 10:45 am

#### Intersectional Disparities in Breast Cancer Screening Mammographies in racial and gender minorities in the US before and during the COVID-19 pandemic

**Sara Liaquat, Masters of Arts in Sociology (G)**

Breast cancer is the second most common cause of death

among women in the United States and it's also the most frequently diagnosed cancer among women. In the United States, around 12% of women are going to be diagnosed with breast cancer in their lifetime. Even though the effectiveness of breast cancer screening mammography in lowering breast cancer mortality rates is well documented, there is still a significant proportion of women in the US who do not undergo screening mammography. Systemic injustices, particularly against racial, ethnic, sexual and gender minority groups in the US are a major reason for severe cancer screening inequities that are unfair and avoidable and as a result, racial and ethnic groups as well as sexual and gender minorities tend to be diagnosed with breast cancer at much later stages. Black women in particular are reported to have the highest mortality rates due to cancer. Inadequate access to high-quality healthcare services in the US, lack of health insurance, financial barriers, and delayed treatment after diagnosis are some of the systematic barriers that impact inadequate use of breast cancer screening among racial/ethnic groups and sexual/gender minority groups in the US. Research shows that the already existing disparities in breast cancer screening rates worsened during the COVID-19 pandemic. This research project, therefore, utilizes the 2018, 2019, 2020, and 2021 Behavioral Risk Factor Surveillance System (BRFSS) data which has been sponsored by the US Centers for Disease Control and Prevention (CDC). Through the BRFSS 2018 and 2019 data, I will be looking at intersectional disparities in ever and recent breast cancer screening before the COVID-19 pandemic, and through 2020 and 2021, I will be looking at intersectional disparities in breast cancer screening during the COVID-19 pandemic, by using logistic regression analysis.

## Session A-5

Oral Biological and Agricultural Sciences

Friday, March 1, 2024 9:00 am

Pride Suite

### 123 9:05 am

#### Alphaproteobacteria lipopolysaccharide stimulates animal metamorphosis

**Morgan Farrell, PhD/ Cell and Molecular Biology (G)**

Lipopolysaccharides (LPS) are structures that coat the surface of gram-negative bacteria, and they are known virulence factors both in the ocean and in the human body. Despite so many bacteria having LPS structures only a few have been identified as having beneficial effects on their animal or human host. Therefore, understanding the structural differences between developmentally inducing bacteria versus pathogenic bacteria is important for future applications for environmental restoration initiatives such as using LPS as a probiotic. Many marine invertebrates like corals, urchins and tubeworms undergo a key developmental change called metamorphosis in response to bacteria. This developmental response is important for marine invertebrates to sustain their populations, but understanding more about development has broad implications to many animals and humans. The marine

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tubeworm *Hydroides elegans* (*Hydroides*) is an emerging model animal that allows us to tease apart the host-microbe interaction involved in metamorphosis. With *Hydroides* as a screening tool I have discovered that an ecologically important class of bacteria, Alphaproteobacteria, are very strong inducers of metamorphosis. Alphaproteobacteria make up 20-40% of the bacteria in marine biofilms and seawater. They also have been identified as possible probiotics in coral restoration and aquaculture, but how they interact with eukaryotes and have this beneficial effect is still being uncovered. To investigate how Alphaproteobacteria induce metamorphosis I have conducted a genetic screen using both CRISPR interference and gene knockouts to target potential genes involved. My data has revealed an impactful discovery that a lipopolysaccharide is responsible for inducing metamorphosis in *Hydroides*.

#### 124 9:25 am

##### The Role of Nuclear Factor $\kappa$ B-inducing Kinase (NIK) in Supporting Ovarian Cancer Stem-Like Cells

**Cassidy Lucht, Master's in Cell and Molecular Biology (G)**

Ovarian cancer is the most lethal gynecological cancer in the United States, largely due to its high relapse rates. Research suggests these high relapse rates are due to cancer stem-like cells (CSCs), a subpopulation of tumor cells that are resistant to chemotherapy and have enhanced tumor-initiation capacity. Post-treatment, CSCs self-renew to re-establish new tumors, leading to recurrent disease that is now resistant to chemotherapy. Given that overexpression of NF- $\kappa$ B has been linked to CSCs, cancer progression, and chemoresistance in various tumors, including ovarian, studies uncovering the mechanisms of this pathway are needed to develop novel therapeutics for ovarian cancer treatment. The upstream activator of the alternative NF- $\kappa$ B pathway, Nuclear Factor  $\kappa$ B-inducing Kinase (NIK), could be an enticing target for eliminating CSCs, however its function in these cells is not established. In our current studies, we show that HGSOC cells grown as CSC-enriching 3D spheroids have increased NIK expression and activity relative to monolayer cultured cells. Moreover, cells expressing CSC markers (CD117+/CD133+), have increased NIK gene expression, further supporting an association between NIK and CSC maintenance. Upon treatment with chemotherapies carboplatin and paclitaxel, NIK gene expression increased in the surviving population, indicating a role in chemoresistance. Knockdown of NIK using siRNA led to changes in alternative NF- $\kappa$ B transcriptional activity and higher sensitivity to carboplatin and paclitaxel relative to vehicle controls. Current studies are evaluating the role of NIK in tumor-initiation capacity, asymmetric division, proliferation, and changes in expression of stemness genes. Lastly, an in vivo relapse model will test the feasibility of using a NIK inhibitor following chemotherapy to prevent relapse and prolong survival. Findings from this work will further define the role of NF- $\kappa$ B pathway components in facilitating CSCs survival and re-establishment of tumors and identify a new potential target for eliminating CSCs in ovarian cancer.

#### 125 9:45 am

##### Prickly Challenge to the Dead End Hypothesis from Native Cactus *Cylindropuntia*

**Niveditha Ramadoss, PhD in Evolutionary Biology (G)**

Approximately 90% of flowering plants display a hermaphroditic system, wherein both male and female reproductive organs coexist within a single flower of an individual. Certain plant species have evolved a unisexual floral configuration. For example, in dioecious sexual systems, populations feature some plants exclusively producing female flowers and other plants exclusively bearing male flowers. In gynodioecious systems individual plants are either females or hermaphrodites bearing bisexual flowers. The separation of sexes is thought to be an evolutionary strategy that helps reduce the risks linked to inbreeding. But the prevalence of dioecious systems in only about 6% of plant species raises the question of why these reproductive strategies are not more widespread. Theory says that dioecious systems may lead to an evolutionary dead end as only half of the population (the females) contributes to seed production and dispersal. This limited contribution can result in lower diversity and a higher risk of extinction for those species. Although phylogenetic studies have cast doubt on this hypothesis, there is a limited number of population genetics studies available for testing. Only two studies have conducted comparisons of genetic diversity among species with varying sexual systems, and these investigations have produced conflicting results. In our research, the aim is to use population genetics approach to test whether the dead end hypothesis applies to the genus *Cylindropuntia* (Cactaceae), which includes several native endemic species with diverse sexual systems. It is expected that dioecy/gynodioecy, which promotes outbreeding, will result in higher genetic diversity compared to hermaphroditic individuals. We collected ~15 individuals from six species with different sexual systems. We sequenced their DNA for variations and calculated the genetic diversity parameters like heterozygosity, number of alleles and inbreeding coefficient. Results showed that the genetic diversity in this genus was overall low implying that this genus is vulnerable to environmental threats. The comparisons of genetic diversity between species with different sexual systems did not support the dead end hypothesis. Furthermore, there is currently a lack of genetic studies on *Cylindropuntia*, and so the genetic parameters estimated in our study will contribute significantly to evaluating their risks of extinction.

#### 126 10:05 am

##### Evidence of Inbreeding and Low Genetic Diversity of a Rare Cactus (*Ferocactus gatesii*) in Baja California

**Yazmín Lommel, Evolutionary Biology/Master's of Science in Biology (G)**

According to the IUCN (International Union for Conservation of Nature), the plant family of Cactaceae is highly threatened with nearly 33% of the species being threatened. One of these potentially threatened cacti, One of these cacti may be, *Ferocactus gatesii*, is exclusively located on 7 granitic islands

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of the 16 total in Bahia de los Angeles, Baja California, Mexico, and is not considered “Threatened” by the IUCN despite its limited distribution and small number of individuals. No genetic analyses assessing its levels of genetic diversity or inbreeding have been conducted to assist in its classification for conservation. Thus, to assist in the determination of its conservation status, we conducted a novel study using the genetics of *F. gatesii*. We hypothesized that *F. gatesii* would be inbred and have low genetic diversity due to inter-island isolation. To determine *F. gatesii*'s level of inbreeding (FIS) and genetic diversity (HO), we collected stem samples during the summer of 2019 that were later extracted and sequenced to obtain Single Nucleotide Polymorphisms (SNPs) before being used to compute population genetic measurements. Our findings identified that *F. gatesii* had low genetic diversity (average HO = 0.071) and high levels of inbreeding (average FIS = 0.388). Our findings provide additional evidence for *F. gatesii*'s conservation which land managers and the international community can use to protect it from threats such as climate change, poaching, and habitat degradation.

## 127 10:25 am

### Effects of ruminant bromoform supplementation on manure wastewater treatment

**Tommie Post, M.S. Civil Engineering [Environmental Engineering] (G)**

As of 2021, the United States methane emissions accounted for 11.5% of all GHG emissions. The largest source of methane is enteric fermentation with an impact of 195 million metric tons (MMt) of CO<sub>2</sub> equivalence. The most effective enteric methane inhibition strategy to date utilizes the seaweed *Asparagopsis taxiformis* as a small percentage of beef cattle's dietary dry matter intake (DMI), resulting in 80% of daily CH<sub>4</sub> emissions being eliminated. This inhibition results in an excess of H<sup>+</sup> ions that are then either expelled as H<sub>2</sub> by the animal or taken into other metabolic pathways resulting in higher levels of VFA's within the rumen. There is also a notable change in the microbiome with a reduction in methanogen populations. These effects of methane inhibition within the rumen lead to the question of the potential effects on the industry's wastewater management. Manure management practices alone result in approximately 70 MMt of CO<sub>2</sub> equivalent methane emissions. In order to anticipate the effect on these management systems in the case of enteric methane inhibitions widespread adoption, this study seeks to understand the changes in manure composition and methane generation potential to understand the effects on anaerobic wastewater treatment. Preliminary results display no significant difference between the methane production between manure samples of beef cattle fed a partially foraged diet and supplemented with *Asparagopsis taxiformis*. These results are the product of biomethane potential tests conducted with three dietary groups representing a control, low dose, and high dose of *A. taxiformis*. Each unique diet was digested in triplicate and maintained at 35 °C with gentle stirring during sample collection. The gas composition and pressures were monitored for each diet for ~8 weeks and gas chromatography was used to monitor the levels of CO<sub>2</sub> and CH<sub>4</sub>.

## 128 10:45 am

### Phenological variation and evolution across space and time in Scarlet Monkeyflowers

**Jordan Waits, Masters of Science in Evolutionary Biology (G)**

Climate change poses an existential threat to biodiversity around the globe, specifically in the California Floristic Province. For plants that are distributed across a broad latitudinal gradient, selective pressures from climate change are applied asymmetrically to populations across a species' range. Populations at lower latitudes face extreme heat and drought stress, but also may be much older and more likely to harbor genes adapted to extreme heat and drought. On the other hand, northern populations are much younger and are experiencing a more rapidly changing climate, rather than one characterized by extreme heat or drought. Quantifying latitudinal trends in environmentally relevant traits is vital for predicting evolutionary responses to climate change in the future. Specifically, the seasonal timing of flowering, or phenology, varies across a species range and is intimately tied to plant strategies for dealing with drought. In this study, we employ a resurrection study to grow *Erythranthe cardinalis* in a common garden at the southern edge of its range. Almost 6000 seeds were acquired and planted from three provenances in southern Oregon, Yosemite, and San Diego in two different years, respectively before and after a period of pronounced drought. We measured day of first flower, height at first flower, and flowering season duration under an additive genetic model. Using the Breeder's equation, we can determine how heritable phenological traits are, as well as the strength of selection exerted on standing genetic variation in different populations. Preliminary results indicate significant differences in phenology across populations, with southern populations exhibiting the most phenotypic change between the two years. Southern populations had a longer flowering season and were significantly more likely to survive and flower late into the year. Our initial results suggest that southern populations are locally adapted and northern populations will likely experience truncated growing seasons under future climate regimes, which could jeopardize their future persistence.

## Session A-6

Oral Engineering and Computer Science  
**Friday, March 1, 2024 9:00 am**  
 Metztli

## 129 9:05 am

### Can Bio-Analyte Detection Be Enhanced Through Optimization of Glassy Carbon Functionalization Techniques and Implementation of Field Effect Transistors?

**Sara Herrera, Master of Science in Bioengineering (G)**

Bio-Analytes are molecules or chemical substances found in the human body that can be detected and analyzed in a clinical setting to offer insights into physiological and biochemical

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processes. Cortisol, a steroid hormone produced by the adrenal glands, is monitored with wearable devices, aiding stress-related clinical research. Glucose, the primary source of energy, triggers insulin secretion in healthy individuals, but in diabetic patients with reduced insulin signaling, continuous glucose monitoring is necessary to understand metabolic cycles and guide insulin injection schedules. N-terminal pro b-type natriuretic peptide (NT-proBNP) is a protein found in the hormone BNP. Its release is indicative of heart failure and can be monitored to predict future cardiac events.

Designing continuous sensors involves selecting materials that will enhance properties such as signal strength and ease of surface functionalization. Functionalization involves immobilizing antibodies, aptamers, or enzymes that can selectively bind with an analyte onto the surface of a sensor. This work focuses on Glassy Carbon due to its biocompatibility and long-term electrochemical stability. The research will explore and optimize techniques to functionalize anti-cortisol antibodies, anti-NT-proBNP antibodies, and Glucose Oxidase (GOx) on sensing electrodes. The design of the sensor will incorporate a field effect transistor (FET). FETs are frequently used in sensor technology because they are advantageous for real-time signal amplification. The addition of an FET will enhance the sensitivity of the sensor, allowing for the detection of analytes even at extremely low concentrations.

Fabrication of the sensors utilizes microfabrication processes, such as photolithography, pyrolysis, dry etching, and wet etching. Functionality and sensitivity of the sensor will be analyzed using electrochemical techniques such as Cyclic Voltammetry (CV). By optimizing the surface functionalization of the sensing electrode surface, we expect to detect signals that correlate with the presence and concentration of our selected analytes. This work will provide insight into how functionalization methods impact monitoring device sensitivity and lead to the development of sensors with enhanced accuracy.

### 130 9:25 am

Ultra low-power, wearable, accelerated shallow-learning fall detection for elderly at-risk persons

**Tian Jingxiao, Phd in Electrical and Computer Engineering (G)**

This study presents an innovative wearable fall detection system (FDS) designed for elderly individuals at risk of unintentional falls. Utilizing a low-power field-programmable gate array (FPGA) and a Convolutional Neural Network (CNN), the system employs an inertial measurement unit (IMU) for accurate and efficient fall detection. The research involves the application of the Caffe deep learning framework for training and validating the CNN model, which is integrated with a Lattice iCE40UP FPGA. This integration facilitates real-time data collection and processing, ensuring timely detection and response to falls. The paper outlines the development process, including the design choices and methodologies, and demonstrates the potential of this wearable technology in enhancing the safety and autonomy of older adults.

### 131 9:45 am

Multi-faceted Mechanics Analysis of Novel Auxetic Meta-structures

**Celia Rufo Martin, Ph.D. degree in Mechanical Engineering (G)**

Over the last decade, the significant presence of auxetic meta-structures in the literature has been leveraged in various applications to achieve diverse, tailored, and enhanced properties. In these structures, topological engineering eclipses the limitations of the base materials, leading to novel mechanics. The physical realization of meta-structures has been empowered by additive manufacturing, unlocking the generation of intricate topologies, even in three dimensions (3D). The influx of research outcomes in this domain enabled their integration into biomedical devices, sports gear, and the aerospace industry. However, the current state-of-the-art lacks a synergistic design framework, building on the cornerstones of additive manufacturing and topology engineering. This work presents a novel 3D spherical meta-structure with unique mechanics, engineered with enhanced flexibility while leveraging rigid-body-dominated mechanical behavior. The design is based on the strategic integration of interconnected 2D shapes in non-orthogonal planes and separated by eccentricities to segregate the deformation. Several configurations were designed and manufactured with a vat photo-polymerization additive manufacturing process for experimental characterization. The 3D printed meta-structures underwent a comprehensive characterization of compressive testing augmented with full field deformation analysis. Additionally, numerical and analytical models were developed to ascertain the performance of the meta-structures further. These results elucidate the feasibility of the newly introduced designs and a promising future of implementations where flexibility is important.

### 132 10:05 am

A Wideband Hemispherical Metasurface (MTS) Antenna with Circular Fractal Elements for 6G Communications

**Somayeh Komeylian, PhD Electrical and Computer Engineering (G)**

We aim to design a novel Metasurface (MTS) antenna consisting of subwave-length elements of fractal concentric circular geometry, printed on a hemispherical surface, and operates in the THz frequency regime. A major disadvantage of existing MTS antennas consists of their narrow bandwidth. We propose the use of fractal circular elements to increase bandwidth. The proposed MTS operates by the interaction of a hemispherical surface wave and an anisotropic impedance boundary condition to generate a radiation field in a direction of interest. Another disadvantage of existing planar reflector MTS antennas are phase delays that result from physical distances between feeding locations and reflector planes, which is accompanied by a significant reduction in bandwidth.

Furthermore, surface current can flow on the ground plane of planar array antennas and diffract from its edges, which results in a radiation pattern that interferes with the useful radiation

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pattern of the array antenna. Our proposed design will achieve spherical coverage without a reduction in bandwidth. Our configuration includes sub-wavelength elements with dimensions in the order of fractions of wavelengths that vary gradually in each concentric circle from row to row, and possesses electrically thin thickness, which is fed by a horn antenna underneath. We propose to employ a nano-scale fabrication process to deploy the proposed MTS to overcome current potential challenges faced by THz frequency beamformers in applications of dense Starlink communications. A deep learning model implemented on a AMD Xilinx Zynq board will perform the beamforming technique for a measured radiation pattern in our MTS. Preliminary simulation results show a highly-directive and “pencil” beam with a high gain for the proposed MTS antenna.

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### 133 10:25 am

#### A Novel Approach in Diabetes Management: The Development and Clinical Implications of a MEMS Cuff Electrode for Vagus Nerve Stimulation

**Ahmad Abushanab, Bioengineering (G)**

The management of diabetes, which is a long-lasting disease, globally requires innovative approaches to treatment. This work presents a type of electrode called the Micro Electro Mechanical Systems (MEMS) cuff electrode specifically designed for vagus nerve stimulation (VNS), which shows promise in managing diabetes. Compared to other VNS devices the MEMS cuff electrode offers advancements such as improved precision, reduced invasiveness, and increased patient comfort. The discussion includes the design and fabrication of the electrode and the use of biocompatible materials to ensure its safety and effectiveness for long-term use. In vivo experiments demonstrate how this effectively modulates vagal activity leading to better glycemic control in diabetic models. Furthermore, the study explores the potential of this device to modulate other physiological processes. The study concludes with an analysis of the clinical implications of this MEMS electrode for diabetes treatment, setting the stage for future research in bioelectronic medicine. The MEMS cuff electrode for VNS not only opens new avenues in diabetes therapy but also serves as a blueprint for future bioelectronic devices in managing various chronic conditions.

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### 134 10:45 am

#### Marine Debris from River Margins: Wet and Dry Weathering Effects on the Fragmentation and Degradation of Discarded Plastic

**Ella Knight, Masters of Science in Environmental Engineering (G)**

Plastic pollution in rivers adversely affects marine life by disrupting physiological processes and ecological habitats. While the role of inland debris in generating marine microplastics (MPs) is recognized, the mechanisms driving the fragmentation and degradation of marine debris remain poorly understood. Existing studies often lack field analysis, relying on

lab-controlled environments with uniform materials like plastic pellets. This research focuses on marine debris from illegal dumping and homeless encampments along river margins, identifying common materials as plastic polymers through surveys by the San Diego River Park Foundation.

Microcosm experiments assessed the breakdown of frequently discarded items (tents, blankets, water bottles) in wet (creek water) and dry conditions over 9 months (October-July) in outdoor enclosures. Weekly observations and scanning electron microscopy (SEM) analyses showed that dry weathered plastic exhibited more pitting, cracking, and grooves, leading to increased fragmentation compared to wet weathered plastic. Wet samples gained mass due to biofilm accumulation.

No evidence indicated increased degradation for specific polymer types; instead, material thickness played a pivotal role. Three dry and three wet sample types experienced density changes affecting buoyancy, impacting item transport. Simulated stream transport with water, cobbles, and sand revealed dry-weathered plastic, particularly Styrofoam, undergoing significant fragmentation.

These findings offer crucial insights into debris degradation patterns, the buoyancy of weathered materials, and fragmentation levels. This information can inform the development of trash capture devices, guide trash collection planning, and contribute to policies preventing debris transport to oceans and coastal areas.

## Session A-7

Oral Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 9:00 am**

Aztlan

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### 135 9:05 am

#### “Bordering on Parasocial”: Personhood and Parasocial Relationships in VTubing

**Micah Sakado, Anthropology (G)**

My proposed project addresses a single chapter in my anthropology master's thesis: parasocial relationships in VTubing. VTubing is a form of online live-streaming heavily influenced by Japanese idol culture. Live streamers, called ‘VTubers’, embody the persona and body of a digital character. Through various technological mediums, VTubing encourages an intimate closeness between users (fans) and streamers.

A buzzword used for discussing fan relationships in VTubing is ‘parasocial.’ Parasocial indexes when a fan-streamer relationship is perceived or treated akin to a personal relationship (such as a relationship with a close friend, family member, or lover). The term has a strong negative connotation – fans believe parasocial relationships may be a slippery slope to toxic fan behavior. Despite being taboo, fan discourse around parasociality in VTubing is complex and revealing.

Through ethnographic research, I argue parasocialism in VTubing complicates cultural borders around personhood by emphasizing the significance of asymmetrical relations within fandom. Fans are simultaneously critical of parasocial behavior

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while also participating in it, creating an epistemological struggle. Through this struggle, fans transcend ideological borders of personhood and relationships.

VTubing suggests new definitions for human relationality – one that places meaning in online relationships through imagined connection and community participation. Through this fan engagement, borders that separate self, community, fan-identity, and VTubers break down. The result is an emergent, unique way to participate in human relationality.

My study of parasocialism aims to help producers of fandom (companies, VTubers, and fans) improve fandom practices by analyzing various attitudes and enactments of parasocial discourse. The VTubing industry, to some degree, relies on parasocialism. Studying parasocial discourse in VTubing will inform producers on how to grow the industry while improving the fandom experience for VTubers and fans. My project does this by tracking the various parasocial attitudes and practices of VTuber fans, clearly articulating its epistemological state in this fandom. In short, I hope to inform a better fandom for companies, VTubers, and fans. The results and methods of this research may be applied to parasocial discourse in other fandoms as well, such as K-pop, Marvel, DC, Disney, anime, and video games.

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### 136 9:25 am

#### Unveiling the Impact of Gloria Calderon Kellet

**Anissa Zuniga, Masters of Arts in History (G)**

This research is intended to propose an in-depth analysis of the body of work created by Cuban-American television writer Gloria Calderon Kellet. Multifaceted in her approaches to storytelling, media, and cultural representation, Calderon Kellet's name has become synonymous with the emergence of Latinos on the silver screen. Working not only as a screenwriter, Calderon Kellet's showrunning and acting credits have also aided her in achieving monumental strides for diversity within television. By analyzing her two most popular television works to date, *One Day at a Time* (2017) and *With, Love*, respectively, this research aims to demonstrate the profound legacy she has left within the television industry, whilst also illuminating the struggle that contemporary Latino audiences find to see themselves represented on screen. In order to execute this objective, critical textual analysis and visual analysis will be utilized, as well as examination into intersectional and humor theory.

This research stands in importance as more Latinos are coming of age in a time of political vilification towards their cultural identity, such as was seen after the events of the 2016 election.

In addition, it aims at contributing to the larger works of exploration into Latino representation in television sitcoms. In understanding and appreciating the work of figures such as Gloria Calderón Kellet, it is crucial in fostering the ethos of “diversity and inclusion,” that so many in the U.S aim to implement.

In composing this research, it is hoped that it will garner significance to the topics of television history and contemporary cultural identity within the United States. As it is intended to be presented within such a heavily Latino-populated area such as

San Diego, the significance of understanding Latino heritage within the US is even more crucial.

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### 137 9:45 am

#### The hypocrisy of the homo economicus. Surveillance capitalism and the law of profit **Chiara Malvestiti, MA Philosophy (G)**

The main goal of this research is to analyse the hypocrisy of the new human category of the homo economicus, highlighting how the law of profit is depriving man of its own morality. Surveillance capitalism is the new economic order that claims humane experience as free raw material for hidden commercial practices of extraction, prediction, and sales. It creates a problem of sovereignty within the notion of man. When economics interferes with ethics, it ends up expropriating man of its own authentic experience. Surveillance capitalism is a new form of bioeconomics that turns our life into data for sale. What we forget is that behind the companies that buy those data there are still people. In order to be considered as a person, the homo economicus should follow both the law of the market and the ethical imperatives as norms. However, it seems like there is a dilemma here: it is either ethics or profit, but not both. What preserves the relation to the other and what protects democracy is no longer present; I am no longer a secret to the other. The ubiquitous computing imposes a digital panopticon where every person is observed by others. Control is subservient to the law of profit and humane experience is turned into raw material for sale. Everything falls into a forecasting perspective as if I can predict the other's action and emotion, then I know what will sell in the market. The homo economicus ends up violating the inner sanctum by using machines and algorithms in order to analyse the meaning of my breath and my gaze, of my voice getting louder. The homo economicus is imprisoning the man within himself, putting the authenticity and secrecy of the human experience at risk.

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### 138 10:05 am

#### Escaping the Confinement of the Self Through Art: Existential Anxiety, Authenticity, and Encountering the Aesthetic in the Quotidian, or How to Live a Thoughtful Life

**Carla Marian Cuevas Morales, Master of Arts in Liberal Arts and Sciences (G)**

The field of aesthetics is a diverse field with loosely defined borders. Questions such as ‘What is art?’, ‘What defines the aesthetic experience?’, ‘How do we engage with art?’ and ‘What does art tell us about how we live our lives?’ have all been considered within the domain of this field. Although these difficult questions do not have a conclusive answer, a handful of dominant ideologies have arisen. Art, the aesthetic, and the aesthetic experience have been defined in terms of emotions, beauty, pleasure, and more—but what can be said about the influence of art, the aesthetic, and the aesthetic experience on how we live our daily lives? How can art influence the way we live our everyday lives by leading us to the aesthetic in the commonplace experiences of the quotidian? At this

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intersection, art is understood to be multifaceted, the aesthetic experience relational, and the conditions for the aesthetic experience largely subjective. More importantly, the aesthetic art of the quotidian is understood from a lens that alleviates existential anxiety by allowing the conceptually isolated individual to have a glimpse into the individual existence of the other. In other words, it is in the aesthetic art of the quotidian that we are freed from the confinement of individuality by encountering evidence of the selfhood of the other.

### 139 10:25 am

#### Effects of Ancient Texts on Modern Attitudes: Comparing Traditional Western and Asian Animal Imagery and Contemporary Motivations for Vegetarianism

**Matthew Brown, Masters of Arts in Philosophy (G)**

This project analyzes how the animal is presented in various ancient texts, including the contexts they are presented in, how they are portrayed, and what effect these portrayals have. The animal depictions examined will come primarily from ancient Daoist texts from China, including the Dao De Jing and the Zhuangzi, while also looking at traditional Western perspectives, mainly from the King James Bible. Comparing animal depictions from ancient China and the West reveals certain attitudes on how the relationship between animals and humans is meant to look. This analysis provides insight on contemporary motivations for vegetarianism in China and the United States, which is discussed and compared using survey research conducted within the past 10 years. Research shows that modern Chinese vegetarians and vegans are more motivated to eat meatless diets due to concerns about animal welfare than those in the US, whose primary motivations include cost and personal health. This suggests that depictions of animals in foundational texts play a role in how a culture treats animals, which in turn influences motivations for vegetarian or vegan diets.

### 140 10:45 am

#### Emnity to Affinity and Beyond: Filipino Eternal Indebtedness

**Rustico Rasing, Masters of Arts in History (G)**

On the 28th of May, 1946, Philippine President Manuel Roxas stated in his speech during the Philippine independence inaugural address, "If we succeed as a nation, if we are able to survive as a nation—and of course we will—we will have America to thank." The words spoken by Roxas emulate a sentiment of indebtedness that is deeply rooted in Filipino culture and consciousness. Cultural traditions of any people are influential to the actions they take; Filipinos are no different. There are many statements within President Roxas' speech that resonate and are emblematic of the Filipino cultural concept of utang na loob (literal translation: debt of the inside). This concept helps to explain the Filipinos' perpetual inclination towards service to the United States and its Armed Forces after gaining national independence from the United States in 1946. It is a wonder why upwards of 30,000 Filipinos prior

to 1978 chose to submit themselves to a hegemonic global power like the United States rather than bolster their newly attained national sovereignty. Filipinos chose to subscribe to US nationality even when they finally gained their own independent national identity after Spanish colonial rule from 1565 and immediately followed by US imperial rule from 1898 to 1946. There is an explanation to the actions of Filipinos through analyzing the history of US-Philippine relations prior to and in immediate proximity following 1946 Philippine independence. Specifically, evidence will help connect the Filipino cultural concept of utang na loob with seemingly conflicting Filipino actions vis-a-vis post-1946 Philippine independence and American nationality.

## Session A-8

Oral Health Nutrition and Clinical Sciences

Friday, March 1, 2024 9:00 am

Mata'yuum

### 141 9:05 am

#### Bridging the Gaps within Concussion Education: A Preliminary Analysis into Proposed Improvements from Student-Athletes

**Madeline Strom, Master of Science in Athletic Training (G)**

Context: National organizations require concussion education to be completed. However, the existing concussion education resources rarely incorporate the student-athlete perspective which may potentially increase effectiveness. The purpose of this preliminary study was to describe what student-athletes would like incorporated into concussion education.

Methods: As part of a larger study, we distributed a cross-sectional survey to collegiate student-athletes. Participants were asked to complete a 32-item survey. Survey topics included participants' previous concussion education, preferences, concussion knowledge, care seeking intentions and behavior, and demographics. This abstract focuses on the education preferences section only (4-items). We calculated frequencies for how participants would like concussion education delivered, desired information, and who the participant would like to provide the education. We also present sample responses for the item, "If you sustained a suspected concussion, what from concussion education would influence you to seek care?"

Results: Fifteen participants completed at least one survey item (Mage=19.9±1.9 years; males=9/15, 60.0%, females=4/15, 26.7%; missing sex responses=2/15, 13.3%). The most frequently requested delivery modalities were video (n=6/15, 40.0%), informal conversation (n=3/15, 20.0%), and discussion (n=3/15, 20.0%) and "I don't want to receive concussion education" (n=3/15, 20.0%). The most frequently requested concussion education content areas were concussion symptoms (n=11/15, 73.3%), impact on athletic performance (n=9/15, 60.0%), proper concussion management (n=8/15, 53.3%), long-term health concerns (n=8/15, 53.3%), and impact on academic performance (n=8/15, 53.3%). Nearly 60%

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of our sample wanted an athletic trainer (n=9/15) to provide concussion education. Participants' sample responses of what would influence them to seek care included: information about long-term health concerns, brain damage/bleeding, and severity of potential outcomes.

Conclusions: These findings can aid in making concussion education more effective by incorporating patient driven feedback. Concussion education should be provided in a meaningful way with videos and/or discussions as guided by the athletic trainer on various topics related to management, performance, and long-term health. By incorporating the patient perspective into concussion education, we can develop more efficient strategies that encourage student-athletes to seek care for a suspected concussion and advocate for athletic trainers.

### 142 9:25 am

#### Association Between Latino Parent and Child Total Physical Activity and Sedentary Behavior

**Savannah Shifflett, Master of Science in Epidemiology (G)**

Background: Parents play a critical role in supporting their children's physical activity (PA); however less is known about parents' support for child PA in underserved populations. The purpose of this study was to examine the association between total parent and child PA (TPA), sedentary behavior (SB), and moderators of this association in a primarily Latino population.

Methods: This cross-sectional study assessed TPA (average minutes per week) and SB (average minutes per week) in 68 parent-child Latino dyads from the Athletes For Life Study. PA and SB was measured for seven consecutive days using GeneActiv wrist-worn accelerometers. Parent and child socio-demographics were collected by interview-administered surveys. Unadjusted and adjusted multivariate linear regression models were used to evaluate the association between parents' TPA, SB, weekday vs. weekend TPA (independent variable) and children's TPA, SB, weekday vs. weekend TPA (dependent variable). Moderators were independently tested for each model via interaction terms with child sex and child age for TPA and SB.

Results: Children's mean age was nine years, 60% were female and 93% identified as Hispanic. Adults' mean age was 38 years, 94% were female and identified as Hispanic. Average adult weekly TPA and SB was 358.7 minutes and 632.64 minutes, respectively. Average child weekly TPA and SB was 332.43 minutes and 594.92 minutes, respectively. In unadjusted models, parent and child TPA ( $\beta=0.006$ ) and SB ( $\beta=0.07$ ) were not significantly associated ( $p>0.05$ ). In adjusted models, parent and child TPA ( $\beta= -0.04$ ) and SB ( $\beta=0.05$ ) were not significantly associated ( $p>0.05$ ). Child sex and child age were not significant moderators ( $p>0.05$ ). The association between parent and child TPA did not differ on weekdays vs weekends ( $\beta=0.04$ ,  $P>.05$ ). However, parent and child SB was significantly associated on the weekends ( $\beta=0.67$ ,  $p<.05$ ), but not weekdays ( $p>.05$ ).

Conclusion: This study did not find significant associations between parent and child TPA, and SB, which is in contrast with previous literature. Our findings emphasize the importance of continuing research in underserved populations to further

understand the association between parent and child TPA and SB, particularly on weekends vs. weekdays.

### 143 9:45 am

#### Navigating Cultural and Collaborative Dietary Strategies: An Ethnographic Approach to Understanding Dietary Behavior in Oaxaca, Mexico

**Lucia Canul, JDP in Global Health (G)**

Oaxaca, Mexico reports a high prevalence of dietary-derived noncommunicable diseases such as diabetes, heart disease and obesity. In the United States, the Latinx and migrant populations from Oaxaca, Mexico concurrently have a high prevalence of these diseases. Many public health dietary interventions do not adequately reflect the cultural relevance and significance of the taste, technique, practice and accessibility of ingredients when implementing dietary intervention programs. This often results in minimal improvements and ongoing struggles for Latinx populations because of an emphasis on dietary guidelines, food elimination, and redirection of food groups which have been generalized to one aspect of cuisine for a diverse population. Projections of the growth of the Latinx/Hispanic population are expected to increase substantially by 2060 which brings an increased need to address the risk and management of these chronic diseases in a culturally inclusive manner.

Qualitative ethnographic fieldwork was conducted to inform long term responsive and collaborative dietary strategies to combat chronic disease in Oaxaca and among Oaxacan communities in the United States for culturally appropriate practices that empower the health of these communities. Through an ethnographic field school, semi-structured interviews and participant observations, oral histories of food culture, recipe preparation, and consumption customs were collected in Ixpantepec Nieves, Oaxaca, Mexico, a rural community with significant migration to the United States.

Findings through inductive qualitative data analysis include relevant recurring themes that are related to the specific cultural dietary behavior including: cultural context of meal design, linguistic limitations and portion size significance.

Results from this project advance the knowledge necessary to implement future research that includes the skills and traditions within Oaxaca and Oaxacan communities for culturally receptive dietary recommendations and interventions.

### 144 10:05 am

#### Hearing Loss in US/Mexico Border Farmworkers

**Christen Rodriguez, Doctor of Audiology (Au.D.) (G)**

Occupational noise exposure is a prevalent, yet often overlooked, public health problem. Excessive noise exposure in the workplace has serious negative consequences including an increased risk for work-related injuries, as well as worker stress and fatigue. The cumulative effect of noise leads to permanent and irreversible hearing loss, which is associated with communication problems and challenges with daily life including depression, isolation, and a greater risk of developing dementia. Farmworkers are an under-studied population

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at a potentially high risk for hazardous noise exposure due to machinery on farms. The purpose of this project is to understand the extent of noise exposure among farmworkers and work towards developing strategies to minimize their risk of noise-induced hearing loss. Our focus is on farms on the US/México border. We partnered with a well-trusted farmworker advocacy organization that has been providing and facilitating health services in their community for nearly three decades. In this presentation, we discuss our community partnership, as well as findings from two years of research carried out at farmworker health fairs, including subjective hearing difficulties in farmworkers (n = 132, mean age = 48 years, range 18-81; 98% Hispanic/Latino), and objective pure-tone hearing screenings via a mobile health unit (n = 31, mean age = 45, range 19-75; 100% Hispanic/Latino). Across these two studies, results indicated that hearing loss is common, and use of hearing protection is rare. For example, over half of farmworkers (51.6%) had hearing loss  $\geq 25$ dB HL at 4kHz, and most farmworkers (93%) reported never receiving hearing protection from their employer(s). We will also discuss challenges in community-based data collection in a highly mobile population and the importance of partnering with a community organization. Our presentation concludes with a discussion of future work, including collecting noise exposure data on the farm and intervention efforts to reduce noise exposure.

#### 145 10:25 am

##### Body composition and incidence of obesity-related cancers among adults in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

**Pragnya Wanjerkhede, MS in Epidemiology (G)**

**Background:** Obesity increases the risk of cancer and disproportionately impacts Hispanic/Latino adults. However, research investigating measures of body composition in association with cancer incidence among Hispanic/Latino adults remains limited. Herein, we assessed the relationships between various measures of body composition and obesity-related cancer incidence in the Hispanic Community Health Survey/Study of Latinos, overall and by sex and Hispanic/Latino heritage.

**Methods:** HCHS/SOL is a multi-site prospective cohort study. Participants included 16,415 diverse Hispanic/Latino adults aged 18-74 years at baseline in 2008-2011. The primary outcome, incidence of obesity-related cancers (n=377), was assessed by state cancer registry linkages through 2021. Measures of body composition included body mass index [BMI; <25 REFERENCE; 25-29.9;  $\geq 30$  kg/m<sup>2</sup>]; and fat mass index (FMI), waist to hip ratio (WHpR), waist to height ratio (WHtR), and waist circumference (WC) (all categorized into sex-specific tertiles. Tertile 1 REFERENCE). Survey-weighted Cox proportional hazards models were used to estimate covariate-adjusted hazard ratios (HRs) and corresponding 95% confidence intervals (95% CIs) for the associations between each measure of body composition and cancer risk.

**Results:** HRs were elevated in the highest categories of body composition and more so among women than men. For example, a BMI  $\geq 30$  (versus <25) kg/m<sup>2</sup> was associated

with a HR of 1.12 (0.75- 1.67) overall, and with a HR of 0.42 (0.22-0.80) among men and 1.75 (1.01-3.03) among women. Similarly, for WHtR, the highest tertile was associated with HR of 1.42 (0.90-2.26) overall, and with a HR of 1.01 (0.56- 1.81) among men and 1.86 (1.08- 3.22) among women; and for WC, the highest tertile was associated with a HR of 1.46 (0.97-2.22) overall, and with a HR of 1.25 (0.69-2.25) among men and 1.58 (0.93-2.68) among women. HRs also varied by heritage group; a unit increase in FMI was associated with a HR of 1.09 (1.01-1.18) among South Americans, a HR of 1.08 (1.02-1.14) among Puerto Ricans, but with a HR of 1.01 (0.96-1.07) among Cubans.

**Conclusions:** Body composition is associated with increased risk of obesity-related cancers particularly among Hispanic/Latino women. Interventions aimed at reducing adiposity among Hispanic/Latino adults may be effective for preventing obesity-related cancers.

#### 146 10:45 am

##### Unlocking Seafood Flavors from Macroalgae: A Sustainable, Vegan Approach

**Jesse Baker, Masters of Nutritional Science & DPD program (G)**

**Introduction:** The increasing demand for vegetarian and vegan food products has propelled the market for alternative seafood products. While macroalgae inherently carry a seafood-like aroma, they often come with a green odor that is undesirable in seafood. This study aims to employ enzymatic hydrolysis and Maillard reactions to enhance the umami taste and seafood flavor of kelp (*Ascophyllum nodosum*).

**Method:** Flavors were generated through Maillard reaction by using hydrolyzed kelp powder with added reducing sugars and amino acids. A dispersion of kelp powder (10%) in water was enzymatically hydrolyzed for 2 hours using Alcalase and Flavourzyme under various pH and temperature conditions, followed by enzyme deactivation at 95 °C for 15 min. Subsequently, the mixture underwent Maillard reaction at 60-100 °C in the presence of various amino acids and reducing sugars (e.g., ribose, xylose, glucose) for 1 hour. The Maillard reaction products were analyzed by gas chromatography-mass spectrometry-olfactometry and sensory evaluation conducted by a trained panel.

**Results:** The optimal reaction condition was determined to be Flavourzyme hydrolysis at a 4% enzyme/substrate ratio, pH 6.5, and 50 °C for 1 hour, followed by the thermal treatment at 100 °C for 1 hour in the presence of 0.5% ribose and 0.5% cysteine. In comparison to non-hydrolyzed samples, the sample treated under the optimal condition exhibited a more pronounced fishy odor. Panelists described the aroma as reminiscent of crab cake and canned tuna. The primary volatile compounds identified in the Maillard reaction products included 1-(furan-2-yl)ethanone, 5-methylfuran-2-carbaldehyde, 2-phenylacetaldehyde, and (Z)-dec-2-enal.

**Significance:** Due to the abundance and sustainable nature of algae production, coupled with the inherent seafood odor present in algae, it emerges as a promising candidate for developing sustainable seafood flavors. This research will help

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optimize reaction conditions for creating seafood flavors using algae ingredients and enhancing our understanding of flavor formation. Further research may lead to the development of a vegan ingredient for flavoring various plant-based or cultivated seafood products, thereby contributing to the formulation of sustainable seafood alternatives.

## Session A-9

Oral Engineering and Computer Science

Friday, March 1, 2024 9:00 am

Visionary Suite

### 147 9:05 am

SoFIE Flow Duct Sensor Calibration associated with Development of new N.A.S.A. Materials Combustibility Standards for Flight Material Choices

**Jack Volponi, Mechanical Engineering (U)**

In an effort to prevent the use of unsafe materials, the National Aeronautics and Space Administration (NASA) and other international space agencies have developed tests to classify the behavior of different materials based upon their flammability, offgassing, fluid compatibility, and odor. All of the tests developed by NASA and their criteria are detailed in the NASA technical standard "NASA-STD-6001B." Due to the lack of dominating buoyant forces in microgravity environments, many researchers believe that some tests described in "NASA-STD-6001B," specifically "Upward Flame Propagation (Test 1)," are not conservative when transitioning to a microgravity environment. In microgravity, materials burn differently in oxygenated atmospheres due to the lack of dominating buoyant forces. This lack of buoyancy forces results in less aggressive flame propagation when a given material is exposed to standard ignition. To validate this hypothesis, the Solid Fuel Ignition and Extinction (SoFIE) Flow Duct, was built to conduct Test 1 in a microgravity environment. The SoFIE Flow Duct is currently located on the International Space Station (ISS).

A functionally and geometrically similar device has been developed by San Diego State University (SDSU) as a senior capstone project. Recently, there has been much deliberation about the sensor used on both the SDSU apparatus and the real SoFIE Flow Duct, the MicroFlowSens MFS02 thermal gas flow sensor manufactured by Innovative Sensor Technology, and the instrumentation circuit on the SDSU apparatus. This research discusses the findings in instrumentation circuit performance and flow sensor behavior as well as instrumentation circuit, software, and sensor calibration experimental setup upgrades. It was found that the instrumentation circuit included a switched capacitance voltage inverter that produced significant noise and significantly affected the output of the sensor. The sensor was also found to be very sensitive to its angle with respect to the flow. To solve these problems, the instrumentation circuit and software underwent significant improvements and a rotary sensor mount was fabricated to properly align the sensor.

### 148 9:25 am

3-D Flow Visualization of Vortex Rings in the Left Ventricle

**Britton Mennie, Biomechanical engineering (U)**

Left Ventricular Assist Devices (LVADs) redirects blood flow in the heart, introducing flow patterns that have been shown to increase risk of thrombosis for patients with end-stage heart failure. Flow in the native heart is characterized by the formation of a large diastolic vortex in the left ventricle (LV) assisting in blood circulation to minimize kinetic energy losses and cardiac work. Study of flow in patients is challenging due to poor spatial and image resolution and fail to account for any comorbidities. An alternative is a mock circulatory loop that simulates the cardiovascular system with LVAD support. Our previous studies found that heart failure in patients results in early decay of vortex circulation and decreased vortex strength but were limited to a single 2-D imaging plane, resulting in a velocity field that featured two counter-rotating vortices that were cross-sections of the vortex ring. The goal of the current study is to measure the 3-D velocity field in the LV during LVAD speeds of 8000rpm and 10000rpm with a bioprosthetic valve and visualize the entire vortex ring during the cardiac cycle. Three-dimensional particle image velocimetry (PIV) recorded velocity flow field under HeartMate 2 support using a mock circulatory loop. Both LVAD speeds were tested with the absence and presence of the cardiac simulator. For the 4 conditions studied, mean aortic pressure was maintained at 80 mmHg to mimic patient conditions. The velocity field shows the intact vortex ring in 3-D, which can be isolated using the Q-criterion as a measure of the excessive rotation rate and strain rate in Matlab. A comparison of the isosurfaces for these four conditions shows that the vortex ring grows more asymmetric as speed increases. The vortex ring stores momentum and conserves energy during normal LV flow. When patients have heart failure with weakened pulsatility, their vortex ring becomes less efficient, and the heart muscle has to work harder to maintain the same activity level. Over time, this demand taxes the heart and initiates pathological remodeling, leading to a decline in health and potentially heart failure.

### 149 9:45 am

Three-Dimensional Flow Studies of the Aortic Root During Mechanical Circulatory Support

**Hailey Harkness, Masters of Science in Bioengineering (G)**

A left ventricular assist device (LVAD) is a mechanical pump implanted to treat heart failure. The HeartMate3 LVAD (HM3) outflow graft connects the left ventricle to the aorta, bypassing the hemodynamically closed aortic valve. Recent clinical studies have found that small LVAD outflow graft angles significantly increase stroke risk by altering the flow dynamics of the native aortic root (AR).

The aim of these studies was to measure the 3-D flow field for different LVAD outflow graft angles in a patient-specific model of the human aorta and calculate indices that indicate stroke risk. A patient-specific aorta was fabricated from transparent silicone with an outflow graft (OG) angle of 60°. The model was attached to a mock circulatory loop mimicking

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human circulation during LVAD support. The aorta was closed with a silicone plug (AV), and the outflow graft attached to a HeartMate3 LVAD. A blood-analog solution simulated the viscosity and density of blood within the circuit.

LaVision's particle tracking system, with 4 cameras and LED light source, captured (PMMA-Rbh) fluorescent particle position at a frame rate of 750 Hz. Pressure and flow were recorded by Labchart at 200 Hz.

Measurements at angles 40° and 50° + or - 3 were conducted at three LVAD speeds, producing consistent total flow rates of 3.1, 4.1 and 4.4 L/min and mean aortic pressures of 53, 73 and 86 mmHg for all OG angles tested.

Vector flow fields in the aortic root, with closed AV, exhibit low velocity and incoherent streamlines. Proximal (AR) velocity was .05-.061m/s for increasing speed at 40° and .08-.11 m/s at 50°. Distal (AR) velocity was greater than the proximal (AV) values and showed coherent streamlines (.116-.190 m/s at 40° and .022-.296 m/s at 50°). Particle residence time was .04-.01 at 40° and .23-.05 at 50°. Illustrating an increased OG angle is linked to flow geometry and the potential for platelet activation, thrombus formation and stroke during LVAD support. Further analysis is underway to characterize vorticity and flow patterns (i.e. Z- Vorticity and Pulsatility Index) in the aortic root.

### 150 10:05 am

Analysis of graphene derived via photolithographically-patterned C-MEMS and incorporation into implantable bioelectronic devices

**Pourya Bayzaie, Master of Science in Bioengineering (G)**

Since its discovery in 2004, graphene has become a heavily researched carbon allotrope, owing to its unique atomic structure. Consequently, graphene has demonstrated excellent thermal and electrical conductive properties, high strength, and potential for biomedical applications. A significant issue that faces graphene research, however, is the fact that graphene is both expensive and time-consuming to produce. Currently, the growing and patterning of graphene rely on chemical vapor deposition (CVD) and laser etching, respectively. A novel approach to solving these issues of time and expense is using photolithographically patterned carbon microelectromechanical systems (C-MEMS). This process entails first growing a carbon precursor, like glassy carbon, onto a silicon substrate, then annealing a transition metal substrate onto the carbon precursor. After annealing the two substrates together, the remaining transition metal is chemically etched off. The resulting material is graphene that has been grown on a silicon substrate via photolithographic patterning. This process of graphene production is ripe for greater research as it has not been performed with various transition metals nor has it been incorporated into the fabrication of existing bioelectronic devices. Therefore, the focus of my research will be analyzing the microstructural and electrochemical properties of graphene grown via photolithographically-patterned C-MEMS through various transition metals. This will pave the way for novel production methods using transition metals and photolithography to create graphene, which will be valuable in both research and industry.

### 151 10:25 am

Simulations of Acoustic Instability in a Pintle Injector Rocket Engine

**Thomas Ridgeway, Master of Science in Aerospace Engineering (G)**

The pintle injector has become a popular choice for liquid rocket engine (LRE) development in the commercial space sector, notably in successfully orbital engines from companies such as SpaceX, Astra Space, Firefly Aerospace, and Virgin Orbit. Historically, understanding and developmental testing of this injector type has remained almost exclusively a result of experimental test data, however the increased popularity of this LRE configuration indicates that it deserves attention from academic research in order to enhance existing data and diversify future development paths.

Pintle injectors have demonstrated stability with greater tolerance to combustion chamber design than other injector types, however they are not immune to instability problems. This research aims to computationally replicate a select case of experimental data from Sakaki et al., 2018, that experimentally showed a high frequency instability. Using computational fluid dynamics (CFD) software Ansys Fluent, this study aims to replicate the results reported by Sakaki within the uncertainty bounds presented alongside the experimental results. By producing a numerical solution to an unstable transient reacting flow validated by experimental data, it is demonstrated that complex reacting flow phenomena can be usefully approximated with computational models. Academic research validation of this simulation type as well as a proven set of models may be used by industry CFD engineers to reduce early development cycle cost by substituting test stand time with reacting flow simulations.

Preliminary results with gas-gas and liquid-gas models show a pressure fluctuation on the same frequency scale as reported by Sakaki, but with an oscillation amplitude less than that reported. Near term work includes a higher resolution mesh to bring  $y^+$  values onto the order of 1, full implementation of a liquid-liquid model to replicate the LOx-Ethanol combustion, and implementation of a more accurate combustion model. Final results will include refined simulations in both 2D axisymmetric and 3D geometries.

### 152 10:45 am

Spatiotemporal Analysis and Deep Learning Image Classification with Google Street View (GSV) of the Homelessness Problem

**Shravani Hariprasad, Master of Science in Big Data Analytics (G)**

In the pursuit of addressing the situation of urban homelessness, this research project explores the homeless community of downtown San Diego. Employing a multifaceted approach, it leverages the transformative capabilities of Geographic Information Systems (GIS) and Google Street View imagery to conduct spatial analysis. Specifically we are targeting five selected streets: 7th Street, Commercial Street, 19th Street, G Street, and K Street.

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This ongoing research analysis of urban homelessness utilizes GPS data to identify homeless areas and employ GIS in ArcGIS Online to visualize these hotspots. This database of Google Street View images spanning from 2007 to 2023 allows for us to uncover trends in homelessness, aid in resource allocation, and create policy improvements. This study involves the development of a deep learning model, specifically utilizing the YOLO version 5 model for custom training on a meticulously curated dataset. This model aims to analyze images to determine the presence of homeless individuals or signs of homelessness. The integration of GIS with advanced deep learning models offers a promising, data-driven solution not only for addressing urban homelessness in San Diego but also for potential applications in other cities.

## Session A-10

Oral Health Nutrition and Clinical Sciences

Friday, March 1, 2024 9:00 am

Park Boulevard

### 153 9:05 am

Identification of Flavor Active Compounds in Micro- and Macro- Algae

**Ellie Cramton, Bachelors of Foods and Nutrition (U)**

Algae is a nutrient dense and sustainable source of alternative proteins. Algae has a distinctive ocean-like flavor and has the potential to be used in alternative seafood. However, the volatile profiles of different species of algae vary significantly. Comparison of the flavor compounds of different algae species has not been well studied. Our study aims to identify flavor active compounds in algae samples using both instrumental analysis and human sensory evaluation. Three kelp (*Ascophyllum nodosum*) and three microalgae (*Arthrospira platensis*, *Chlorella vulgaris*, and *Dunaliella salina*) powders were characterized for their flavor profiles using headspace solid-phase microextraction and gas chromatography-olfactometry-mass spectrometry (HS SPME/GC-O-MS). Over fifty volatiles were detected, including pleasant aroma compounds such as D-limonene (citrus and fresh aroma) and linalool (citrus, floral, sweet), as well as undesirable compounds like (E)-2-octen-1-ol (soap and plastic aroma). Numerous volatiles from seafood were detected in the algae samples. All three kelp samples and *A. platensis* powder contained 1-octen-3-ol, which presents a mushroomy and green aroma and is a key-aroma compound of crab, tuna, and salmon. *A. platensis* and *C. vulgaris* contain the flavor compound tetramethyl pyrazine, which is found in crab and shrimp, and presents a grassy and musty aroma. Future research will delve further into human sensory analysis of these samples. The knowledge on the flavor profiles of algae ingredients will further understanding on the flavor compounds formation and removal, as well as providing guidance on developing seafood flavor from algae.

### 154 9:25 am

Better Space Parties with Algae-Enriched

## Guacamole

**Rebecca Vernazza, Foods and Nutrition (U)**

As space exploration continues to gain momentum, astronauts are searching for sustainable products that deliver both essential nutrients and flavor satisfaction. Our study aims to develop a shelf-stable guacamole dry mix enriched with microalgae that can be enjoyed by astronauts in

Space following rehydration. We hypothesize that the formulation, which combines avocado with microalgae, will strike a balance between stability, palatability, convenience, and nutrient density. To explore the flavor profile of microalgae, volatile compositions of dried *Arthrospira platensis*, *Chlorella vulgaris*, and *Dunaliella salina* biomass were analyzed using headspace solid-phase microextraction and gas chromatography-olfactometry-mass spectrometry (HS-SPME/GC-O-MS). Over 60 volatile compounds were detected using an HP-5 capillary column. A prototype of freeze-dried guacamole mix was developed and the effects of processing order (freeze-drying before or after formulating the product), product fineness (pureed versus mashed), water content for rehydration, and lime juice quantity on color, texture, and flavor of the product were examined. The guacamole's consistency in texture and drying was ensured by preparation before freeze-drying. The incorporation of acids from lime juice inhibited enzymatic browning in the products. Rehydration with 80% of the removed water yielded the most favorable texture. The impacts of microalgae incorporation on product flavor, color, and texture was analyzed using sensory evaluations. The product's refinement will continue based on both instrumental analysis and sensory evaluation.

### 155 9:45 am

Is Health Literacy Associated with Concussion Care Seeking Intentions and Behavior in Collegiate Students?

**Julia Ng, Bachelors of Science in Kinesiology, Pre-Physical Therapy (U)**

Context: Individuals who sustain a concussion but do not seek care can experience greater symptom burden and prolonged recovery. Health literacy is defined as the degree to which individuals can effectively access, interpret, and comprehend health information and seek care. Currently, it is unknown how health literacy influences concussion care seeking. The purpose of our study was to determine if health literacy predicts concussion care seeking intentions and behavior.

Methods: College students completed an online survey. Health literacy was measured using the 4-item Brief Health Literacy Screening Tool (BRIEF; rated on a 5-point Likert-scale). BRIEF scores are categorized as inadequate (4-12 scores), marginal (13-16 scores), and adequate health literacy (17-20 scores). Indirect (9-items) and direct care seeking intentions (3-items) were rated on a 7-point Likert-scale. Both scores were averaged with higher scores indicating more favorable disclosure intentions. Indirect care seeking behavior was evaluated with 10-items and categorized as "care seekers" and "non-care seekers." Participants who disclosed 100% of concussions/bell-ringers/dings experienced were categorized

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as “care seekers.” All others with an event to disclose, but did not, were categorized as “non-care seekers. We calculated four univariate regressions to understand the association between BRIEF categories and care seeking intentions (two linear regressions), and behavior (two logistic regressions).

Results: Two hundred and sixty-two students provided at least one response for the survey with 257 completed submissions (completion rate=96.3%; age=20.7±2.2 years; male=96/267, 36.0%; female=159/267, 59.6%, non-binary/third gender=1/267, 0.4%, no response=11/267, 4.1%). Participants with marginal and adequate BRIEF scores had higher indirect intentions compared to inadequate BRIEF scores by 0.40 and 0.51, respectively ( $F_{2,258}=3.72$ ,  $p=0.026$ ,  $R^2=0.028$ ). BRIEF scores were not associated with direct intentions ( $p=0.058$ ), or behavior (indirect:  $p=0.544$ , direct:  $p=0.900$ ).

Conclusion: Health literacy may play a role in concussion care seeking intentions, however this did not translate to behavior and it may be small especially given the level of variance suggesting many other factors contribute. Future research may incorporate health literacy in concussion care seeking, but it should be being addressed in concussion education and management universally in order to ensure positive concussion outcomes are achieved.

## 156 10:05 am

### Kinematics associated with patellar tendinopathy in collegiate basketball athletes

**Sarah Konig, Kinesiology Pre- Physical Therapy (U)**

Introduction: Patellar tendinopathy (PT) is one of the most common injuries in sports with repetitive jumping. More than one in three collegiate basketball players are estimated to have PT or a patellar tendon abnormality (PTA)(1). Several movement patterns are associated with PT, including less knee flexion movement during a jump landing. Prior investigators have reported that collegiate basketball athletes with PTA display less knee flexion movement (38.3°) during a horizontal landing prior to a vertical countermovement jump compared to athletes with healthy tendons (51.9°)(2).

Purpose: Since PT is ubiquitous within collegiate basketball athletes, the purpose of this study was to determine the extent to which athletes who participate in a pre-season biomechanics screening program display reduced knee flexion movement during the first landing of a drop vertical jump (DVJ). This data would provide valuable information to athletics medical staff to guide injury prevention and to improve performance.

Methods: This study included 11 SDSU Division 1 male collegiate basketball athletes averaging 20.6 (+/-1.84) years old. A 16-camera optical motion capture system was used to measure full body kinematics during the DVJ task. Reflective markers were placed on anatomical landmarks to define bone segments and joints. Athletes were instructed to step off a 30 cm box and land on both feet, followed by a maximal countermovement jump. Data was calculated based on the first landing. Knee flexion excursion for each leg was calculated from the difference in knee flexion at initial contact to the

minimum knee flexion before the athlete leaves the force plate. Results: On average, our athletes went through 44.3°(+/-7.96°) of knee flexion on their left leg, and 46.6°(+/-16.5°) on their right. Seven (63.6%) athletes displayed less than 38.3°, on nine (41%) limbs.

Conclusion: More than half of the athletes screened displayed the movement pattern associated with PTA. The extent to which this pattern or PTA is associated with the development of patellar tendinopathy is unknown. We are in the process of conducting more research to examine the association between movement patterns and injury risk.

## 157 10:25 am

### Asymmetry between non-dominant and dominant limbs in female collegiate lacrosse athletes during a drop vertical jump

**Jade Jachim, Interdisciplinary Studies in Three Departments (Biology, Chemistry, Psychology) + Public Health minor (U)**

Limb dominance is a factor associated with knee injuries, particularly in female athletes. Prior studies have reported that females are twice as likely to suffer a non-contact knee injury on their non-dominant (loading) leg versus their dominant (kicking) leg, however, there is limited research examining risk factors for non-contact injuries in sports that are more asymmetrical in nature like lacrosse. This study aims to examine the asymmetry of previously described risk factors for non-contact injuries on the non-dominant vs. dominant limb during the countermovement phase of a drop vertical jump (DVJ) task in female collegiate lacrosse athletes.

Prior to the start of the spring season, 18 women's collegiate lacrosse athletes were tested in a biomechanics laboratory. For the DVJ, participants stepped off a 30cm step, landed on both feet and were instructed to jump as fast and high as they could. A 3D motion capture system was used to measure lower extremity kinematics during the DVJ in reference to a standing posture. Maximum knee valgus, a known risk factor for non-contact Anterior Cruciate Ligament injuries, was measured in degrees during the countermovement phase of the DVJ. Limb dominance was established by asking athletes which limb they would use to kick a soccer ball (dominant/kicking), and which limb they would use to jump from (non-dominant/loading) Differences in maximum knee valgus between the non-dominant and dominant limbs would be examined across athletes using a paired t-test ( $\alpha=0.05$ ). We hypothesize that female lacrosse athletes will display greater knee valgus on the non-dominant limb compared to the dominant limb. The 3D motion capture data has been collected and is being processed; data analysis will be conducted during the Spring 2024 semester.

The results of this study will provide valuable insights into the impact of limb dominance on the asymmetry of knee valgus exhibited by female lacrosse athletes during the countermovement phase of a DVJ task. These data may uncover mechanisms underlying the greater risk of non-contact injuries on the non-dominant limb in female athletes.

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**158 10:45 am**

**Obesity and Socioeconomic Influences: A Geographic Analysis of the Hispanic Population in Los Angeles, California**

**Salma Iraqi, MPH in Epidemiology and Biostatistics (G)**

Obesity, a chronic condition, is a serious threat associated with cardiovascular diseases, type 2 diabetes, and other conditions that may shorten the life-span of an individual. In the United States, obesity is a public health crisis, affecting approximately 45% of the Hispanic population when compared to other ethnic groups. Among Hispanics, 78.8% are overweight or obese. With Hispanics being 1.2 times more likely to be obese than non-Hispanic individuals. This study analyzes spatial associations between obesity prevalence, Healthy People Index (HPI) score, and socioeconomic status (SES) at the census tract level. HPI scores serve as crucial data points based on social conditions influencing health, including education, job availability, environmental indicators, such as clean air and water. Our analysis focuses on understanding the correlation between obesity prevalence and HPI scores at the census tract level within Los Angeles (LA) County, California while considering the Hispanic population density at that geographical level. Recognizing poverty level SES variables as potential contributors to the social determinants of health influencing obesity prevalence, we aim to understand the complex links. individuals who are overweight or obese are more susceptible to additional chronic conditions, thereby increasing the risks of heart disease and strokes. By understanding the correlation between Hispanic population density, poverty levels, and obesity rates in different census tracts of LA county, we can tailor interventions to meet the unique needs of these communities. It emphasizes the importance of addressing social determinants of health, such as economic conditions and cultural factors, to aid in formulating such interventions.



# Abstracts of Presentations

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## Session B

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session B-1

Oral Behavioral and Social Sciences 1

Friday, March 1, 2024 11:00 am

Love Library 430

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### 159 11:05 am

#### Rejoicing, Rewarding, and Rejecting: An Investigation of Affection in Intimate College-Aged Relationships

**Isabel Villegas-Glang, Bachelor of Arts in Communication (U)**

Affection functions as a strong means of maintaining and strengthening relationships, though maintaining affectionate messages in college-aged relationships throughout stressful times appears to be difficult. The primary goal of this qualitative interview study is to understand how college-aged individuals in relationships communicate and express affection, especially when stressed out. To effectively investigate affectionate messages in relational communication, affection exchange theory (AET, Floyd, 2001) and relational maintenance strategies (Canary & Stafford, 1992) are the conceptual framework. This study utilizes three ultra-rich qualitative interviews with women between the ages of 20-22 who have been in a heterosexual relationship for more than one year. The interviews were transcribed and coded on NVivo Qualitative Software, with thoughts as the unit of analysis. Grounded theory (Charmaz, 2001) was used to describe what the interviewees were describing in their interviews, aiming to understand affection through the participants' experiences and thoughts. Coding was performed in two cycles to condense, compare, and redefine codes into overarching themes. Themes were created with the consideration of previous research and theories that pertain to affection to be analyzed at a deeper conceptual level, and the three strongest themes were chosen for analysis. The primary findings include that college-aged individuals enjoy expressions of affectionate assurance, especially when they are stressed out. However, sometimes their stress can manifest in relationships, leading to a decrease in affectionate messages. Therefore, partners tend to withhold affection during stressful situations as they cannot dedicate as much time to assuring behaviors and messages. Words of affirmation prove to be very important to women in this age group, which creates a paradox between individuals wanting to be affirmed and not acting in an affirming way towards their partners. These findings relate to AET and larger theoretical implications as they provide a small, yet impactful, insight into how college-aged women communicate and receive affection. Through this study, it has been concluded that individuals in this age group should work to express their affectionate feelings to their partners, especially when parties are stressed to further thrive.

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### 160 11:25 am

#### Authoritarianism in the EU integration process

**Gianni Louis Fungipani, Undeclared (U)**

A surge of authoritarian ideas and extremist views have

increased in political influence in Europe over recent years. How does an increase in authoritarian tendencies and regimes influence the future of the European Union in terms of being able to deal with regional and international challenges like conflict, climate change or extremism?

I conduct a scholarly literature review to answer this question. I draw upon academic, government, and other reputable sources. Policy makers, activists and scholars should be interested in this research, because authoritarianism challenges democratic processes, thereby undermining collaborative efforts to deal with environmental and other crises.

Indeed, I find that growing extremism threatens the legitimacy of the European Union, and I discuss the implications of this trajectory as well as provide policy recommendations.

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### 161 11:45 am

#### Why Does Gender Matter? Student Perspectives on Leadership

**Sydney Stafford, Bachelor of Arts in Communication (U)**

In accordance with research findings in the last decade, society has grown to believe and understand that being a successful leader is not determined by gender. This research aims to recognize how gender affects leadership styles among student leaders at San Diego State University in compliance with social role theory. By analyzing the experience of each interview participant, the importance of finding gender discrepancies in leadership as well as how these students efficiently lead is evident throughout this study. Investigating various forms of challenges, conflict, and team productivity have proven many commonalities and differences among female and male participants in their respective professional environments. Each participant included in this research is an active student leader at San Diego State University. To maintain a parallel and equivalent study, two feminine-identifying and two masculine-identifying individuals were interviewed. This led to a total of four interview participants contributing to the research study (N=4) from various backgrounds and involvements at San Diego State University to maintain the effects of triangulation. In findings across all participant groups, male and female student leaders spoke on the importance of communication and effectively communicating in leadership roles. However, it was found that in using communication techniques masculine and feminine individuals differed. Feminine-identifying participants used communication to create relationships with team members and work together toward problem-solving. Alternately, masculine-identifying individuals communicate to send messages to team members in order to efficiently complete tasks. These findings are consistent when comparing these results to social role theory as these male and female student leaders fall into categorical roles tied to gender through their communicative practices. Finding relationships between empathetic leadership and femininity, as well as task efficiency and masculinity, allows research to expand through various perspectives and lenses. As social roles shift, grounded research in gender and leadership can catalyze posterity to believe in the success across leaders of masculine and feminine identities.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

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### 162 12:05 am

#### Fighting for Gaza: Assessing student mobilization movements and shifting foreign policy perspectives

**Allison Gallant, Bachelor Political Science (U)**

The events of October 7th surged into utter violence and destruction for both Israel and Palestine, yet what would follow in the United States assumed a type of political and social awakening that had been previously dormant for decades. The effects of violence in Israel and Palestine assumed a mobilization of students across the world to ban together in an effort to condemn the human rights violations committed, while calling for a universal ceasefire in Gaza. My research answers the question of “why now?”, while examining the past decades of political participation regarding Israel/Palestine and the older generations of individuals' tendencies to support Israel. I will aim to understand the importance of this generation in their efforts to denounce Israeli occupations of Palestine and campaign to influence American foreign policy, particularly analyzing the mobilization of student groups at San Diego State University. I will include the influence that American media has had on portraying the conflict, subsequently influencing American political opinion and the overall stance that each party takes regarding the decades-long conflict that has since impacted the world.

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### 163 12:25 am

#### Exploration of the Slavic Impact on Romanian Language Change

**Devi Garnero, Language Culture and Society major and Italian minor (U)**

Why is it that Romanian sounds to the untrained ear similar to Slavic languages such as Russian or Bulgarian, when in reality it's closely related to Romance varieties like French? Despite being derived from Latin, Romanian is spoken in Eastern Europe, and through centuries of contact with a variety of Slavic languages has adopted many Slavic-like traits. Due to the impact of the Slavic language family in shaping various linguistic aspects of Romanian over centuries of interaction, Romanian holds a unique position within the Romance language family. This report examines the influence of Slavic languages on language change in Romanian, focusing on components of phonological, morphological, syntactic, and lexical changes. The work aims to examine an extensive and diverse body of literature, unraveling the intricate interplay of historical and linguistic factors that have shaped Romanian's linguistic landscape. Using changes that took place internal to Romanian as a basis, I compiled and analyzed a broad set of reports into this review, each focusing on certain aspects of Slavic-based language changes. Slavic influence extends to the vocative case, affixes, position of relative adjectives, scrambling and auxiliary inversion, palatalization of certain vowels, emergence of certain phonemes via borrowing, and loan words. In this literature review, examining the prior works comprehensively enables one to grasp the significant role that Slavic languages played in the evolution of Romanian, offering a thorough understanding of its influence. The course of this research demonstrates that Slavic languages have had

a monumental impact on the Romanian language, unrelated to the natural path of evolution that Romanian inherently undergoes as a Romance language.

## Session B-2

Oral Behavioral and Social Sciences 2

Friday, March 1, 2024 11:00 am

Love Library 431

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### 164 11:05 am

#### Complications of Brexit: The Troubles and Northern Ireland's Identity Politics

**Samantha DiDomenico, Bachelor of Arts in political science (U)**

This project analyzes the impact of the Brexit withdrawal agreement on socio-political dissension surrounding identity and border politics in Northern Ireland. Could the 2016 referendum decision of the United Kingdom to leave the European Union (Brexit) be the linchpin for Irish reunification? Or perhaps a regression into the violence of the Troubles? Seven years after the Brexit vote, the Brexit decision continues to generate disagreement due to the unique challenges of the Northern Ireland issue. This literary survey provides a historical analysis of secondary sources and public opinion data (qualitative and quantitative) investigating potential shifts in the direction of reunification with the Republic of Ireland/ dissatisfaction with the United Kingdom; of cooperation between, namely, the EU, UK, Irish governments, critical political parties, and citizens in attempts to fully resolve both The Troubles and Brexit complications for Northern Ireland, or of simply maintaining the status quo. The aim of this project is to understand the scope and significance of the Brexit decision on the potential for reagravating the border between Ireland and Northern Ireland, playing into the game of identity politics that precipitated decades of violence known as The Troubles. Despite the highly successful Belfast/Good Friday Agreement of 1998 which ended the height of the violence, the conflict— physical and political— continues, worsened in many ways by the 2016 Brexit decision. My analyses of the research and data show that current attitudes have changed despite the rise of historic tensions. Due to complications from deep and conflicting beliefs, the status quo of unresolved conflict is likely to continue for the next decade, barring significant developments; and any solutions to the “border problem” posed by Brexit would likely be unacceptable to the groups involved. These findings emphasize the necessity for comprehensive solutions which accommodate all groups, in order to maintain peace and social order for Northern Ireland.

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### 165 11:25 am

#### The Interconnectedness of Love and Guilt: Discovering the Path to Conocimiento and Healing by Confronting Guilt with Love

**Jenae Dellafosse, Bachelor of Arts in Sociology (U)**

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

While acknowledging the powerful human emotion of guilt and its potentially overwhelming impact on individuals, this research analyzes how love can be used as a tool to help reduce the feeling of guilt. Established social science research connects guilt to negative repercussions in relationships with others and oneself. Reflecting upon guilt's obstructive impacts, this research explores renowned author bell hooks' idea of redemptive love and its correlations with Chicana theorist Gloria Anzaldúa and educator Stephanie Cariaga's scholarship on healing, self discovery, pedagogies of the bodymindspirit and the path to *conocimiento*, or "awakening consciousness". Using women of color feminist epistemology and *plática* (group storytelling) methodology as a form of healing within itself and qualitative analysis, I organized and participated in multiple *pláticas* to co-create knowledge and illuminate our gendered and racialized experiences with guilt and love. Throughout these *pláticas* we personally defined guilt and love, discovered triggers for guilt, and shared stories demonstrating how love and guilt have impacted one another and ourselves. In conclusion, we discovered that showering the feeling of guilt with love helped reduce the feeling of guilt and can instead result in self discovery and the path to *conocimiento*.

**167 12:05 am****Land Access, Gentrification, and Urban Agriculture In San Diego****Tyana Ortiz, Environmental Science (U)**

In recent years, especially in the context of climate change, cities have been under pressure to provide public green spaces that offer different benefits and uses for their residents. In that context, community gardens are an important resource that have significant potential environmental and social benefits, especially in areas where there is a lack of access to fresh and nutritious foods.

In a research project investigating urban agriculture in San Diego, we gathered extensive data about fifty-three community gardens. We found that the majority were located within historically marginalized communities that are now experiencing gentrification. In these areas, however, gardens were often very small because of the lack of available and affordable space. Indeed, San Diego has been listed as the most expensive place to live in the United States, leading to gentrification pressures in older urban neighborhoods and creating barriers to land access for urban gardening. While there is vacant land that could be made available for urban agriculture, speculation related to real estate development often makes it unavailable to community groups. Preliminary evidence from interviews conducted with managers of community gardens suggest that organizations running community gardens fear losing access to their lands at the whims of the real estate market and often have long waitlists.

Our study investigates the availability and affordability of vacant lots that could be used for urban agriculture within the region, using data from the County of San Diego and the US Census. We use Geographic Information System to examine the spatial relationship between available space, property value, gentrification, and demand for urban agricultural land based on the current number of people who garden and those on

waitlists. and gentrification pressure. Our goal is to determine the feasibility and affordability of converting available spaces for urban agriculture in a context where land use is primarily driven by market dynamics. The results of this study could inform policy to support future expansion of community gardens in high need areas as a way to help create greener cities by providing growers with valuable information.

**168 12:25 am****Cheek pouch use of *Macaca maura* in proximity to road in Bantimurung Bulusaraung National Park, Sulawesi, Indonesia****Emily Rapp, Environmental Sciences B.S. (U)**

Cercopithecine primates possess a distinct feature known as 'cheek pouches' that are believed to have adaptive functions, such as reducing feeding competition. As part of a 6-week, NSF-funded International Research Experiences program, I had the opportunity to study the use of this adaptation in endangered moor macaques (*Macaca maura*) living in Bantimurung Bulusaraung National Park, Sulawesi, Indonesia. This program involved one week of training and two weeks of preliminary observations, preceding the development of my mini-project. For my mini-project, I chose to observe feeding and cheek pouch use by the moor macaques while in the forest and while along the road. I conducted 60 hours of observation across six days in July-August 2023, collecting all occurrences of feeding and evidence of cheekpouching. I found that when the monkeys were feeding on the road, 50.7% of the feeding records involved the use of cheek pouches, while in the forest cheek pouches were used in only 2.5% of the feeding records. Of the monkeys that used their cheek pouches on the road, 97.3% of feeding records involved provisioned foods, while 2.7% of feeding records involved wild foods. Additionally, when the monkeys on the road used their cheek pouches, 59.5% of feeding records showed that there was another individual within two meters, while 40.5% of feeding records show no individuals within two meters. These results are significant because they suggest that provisioned foods may generate within-group competition, particularly given the way foods are provisioned from moving vehicles. This physical adaptation may help the moor macaque monkeys navigate future human interaction, as road infrastructure is part of their habitat. Future studies on within group competition can elevate this research. Overall this program developed my research skills and solidified my interest in conservation research for my future career. More importantly, I learned more about myself and the world in the cross cultural interactions I had with our Indonesian peers.

**Session B-3**

Oral Biological and Agricultural Sciences

**Friday, March 1, 2024 11:00 am**

Legacy Suite

**169 11:05 am****Aerobic Activity is Impaired by Vaping**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

### **Sama Mikhail, Bachelor of Science in Microbiology (U)**

Vaping and e-cigarettes are popular with young adults due in part to the perception of harm reduction compared to traditional cigarette smoking. Vaping offers a safer alternative to cigarette smoking but still can promote pathological changes that diminish the health and lifestyle activities of frequent users. Aerobic exercise improves cardiovascular health, but the influence of physical activity upon vaping-associated pulmonary injury (VAPI) is poorly understood. The long term goal of this study is to assess the impact of aerobic exercise upon VAPI. Cohorts of male (n=4) and female (n=4) C57BL/6 in four treatment groups consisted of: 1) no exercise, no vape; 2) no exercise, vape; 3) exercise, no vape; and 4) exercise and vape. Physical activity on voluntary running wheels was measured four days per week by tracking the number of wheel revolutions per evening. Vape aerosol exposure was performed using an automated inhalation apparatus (SCIREQ InExpose) equipped with JUUL pens loaded with commercially purchased Peach Ice flavored juice (ORGNX; zero nicotine) for 4 hours per day and 5 days per week. Results demonstrate that exercise performance is reduced by vape aerosol exposure after 4 weeks compared to the running-only cohort. Both sexes initially show increased exercise performance with acclimation to the running wheels within the first few weeks with female mice consistently running approximately 3.2 kilometers more than corresponding males 11.8 versus 14.9 kilometers for females versus males, respectively. Variability between individual mice was evident, but vaping led to a substantial decrease in distance run for both females and males after 4 weeks 13% and 12.5% lower, respectively. These findings demonstrate that vaping impairs aerobic exercise capacity with sex-specific differences in outcomes. Ongoing studies will determine the mechanistic basis for aerobic exercise impact upon VAPI using a combination of molecular, histologic, and functional analyses. In conclusion, females appear initially more resistant to VAPI than males but this advantage may be lost with prolonged exposure.

### **170 11:25 am**

#### **Determining Cloning in Native Succulent Population**

##### **Camille Movafagian, Bachelor of Science in Biology (U)**

Agave shawii, also known as Shaw's agave, is a native succulent found in Baja California and Southern California. This species is very important and versatile to Native Americans in these areas, who use the succulent for its nutrition and durability for tools and clothing items. Previous research on Agave shawii has focused on its unsuccessful reproduction rates and low seed counts. For the populations located in Southern California, it has been difficult to pinpoint specific pollinators of the species. There has also been research focusing on how the increase in temperature in Southern California decreases the environmental pressure on Agave shawii to reproduce as frequently and instead live longer. Despite these challenges, Agave shawii is not listed as threatened or endangered on the Environmental Conservation Online System. The purpose of this study is to determine the genetic diversity of the Agave shawii population at Cabrillo

National Monument (CNM), which is located at Naval Base Point Loma in San Diego. We want to determine if individuals in this area are reproducing via cloning. Even though this clonality helps keep population numbers high, it causes the genetic diversity to plummet. We previously collected a total of 110 samples from 55 individuals from Cabrillo National Monument. In order to assess whether the CNM population has depleted genetic diversity, we have collected from 7 populations of Shaw's agave from other regions in Baja California in which the species is more abundant. We collected a total of 72 samples from 72 individuals in Baja California. DNA extractions have been completed for all samples and sequencing is undergoing. We hope our results can give us information to understand the genetic diversity of the populations of Agave shawii. If cloning is found in this population, it will be crucial to look into possible causes for this occurrence. This research will help us work towards successful conservation and reproduction of the Agave shawii population in Southern California. We also hope this research will shine light on other species that are improperly documented and in need of reproductive and conservation studies.

### **171 11:45 am**

#### **Accurate growth kinetics and biochemical composition characterization enable smart cultivation of nutritious marine Dunaliella salina biomass to enhance space food**

##### **Shailla Prasad, Bachelors of Science in Microbiology with emphasis in CLS and minor in Chemistry (U)**

Dunaliella salina is an edible unicellular microalgae known for its antioxidant content (e.g.,  $\beta$ -Carotene and 9-cis- $\beta$ -Carotene). On top of that, D. salina biomass is rich in edible proteins (>40%), lipids (>15%), vitamins, and minerals becoming an excellent source of nutrients for the astronaut food that is being designed within NASA's Artemis project. Throughout its cultivation cycle, D. salina changes its appearance, displaying green, yellow, and orange coloration as a result of the dynamic accumulation of pigments. The main goal of this project is to accurately estimate growth kinetics parameters and to perform proximate biochemical composition analysis of D. salina throughout its optimized growth cycle, focusing on total protein (Lowry method), carbohydrate (acid digestion method), lipid (gravimetric analysis), and photosynthetic pigment (cold acetone extraction) content. The Gompertz-Zwietering growth kinetics model was used to estimate the autotrophic and mixotrophic growth parameters (i.e., biomass carrying capacity (A), growth rate,  $\mu_{max}$ , and lag time,  $\lambda$ ) of D. salina during its reproduction at three different salinity levels (6% w/w, 8% w/w, and 9.5% w/w), and in the presence of citric acid at different initial concentrations (0, 1, 2.5, 5.0, 7.5, and 10 mM). It was determined that concentrations of ~8% salinity and concentrations of ~5mM of citric acid are factors that lead to increased growth rates in D. salina. Within the citric acid experiment, it was observed that cultures with citric acid had lower overall biomass production than cultures without it. After selecting the optimal salinity and citric acid levels, accurate biochemical composition data were measured over

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time to generate objective biomass equations that enhance the predictive capabilities of high-quality Genome-Scale Metabolic Reconstruction models. Moreover, the Gompertz- Zwietering kinetic parameters were used to establish cultivation times of the three different phenotypes that show up during the early exponential (green), late exponential (yellow), and stationary (orange) phases. The combination of kinetic analysis, proximate biochemical analysis, and biomass objective function results help determine optimal *D. salina* cultivation times to enhance the nutritional value of *D. salina* biomass incorporated in a space food product that is visually appealing.

### 172 12:05 am

#### Identification and functional analysis of ABC transporters in the planarian *Schmidtea mediterranea*

**Rania Atto, Bachelor in Microbiology (U)**

The ATP-binding cassette (ABC) transporters import and export substrates across membranes through active transport. ABC transporters are heavily studied for their roles in drug resistance, nutrient import, and the movement of toxins and drugs across membranes. ABC transporters have yet to be examined in highly regenerative organisms like the freshwater planarian *Schmidtea mediterranea*. These non-parasitic flatworms have a large population of pluripotent adult stem cells (neoblasts), granting the remarkable ability to regenerate whole worms from small tissue fragments. Characterizing ABC transporters in planarians may uncover roles for these genes in stem cell-based regeneration, tissue homeostasis, or toxicology. Using BLAST analysis of the planarian transcriptome compared to known ABC transporter amino acid sequences from *Lytechinus pictus* and *Strongylocentrotus purpuratus* (two sea urchin species), we identified twenty-one ABC transporter genes in *S. mediterranea*, encompassing five subfamilies. We used whole-mount in situ hybridizations (WISH) to validate gene expression domains within the epidermis, brain, intestines, and neoblasts, correlating with published single-cell RNA-seq data. We hypothesize that ABC transporters have significant roles in waste filtration and substrate transport into the epidermis, gut, and central nervous system in *S. mediterranea*, and functional roles in stem cell-based regeneration. To test this, RNA interference (RNAi) knockdowns of each gene were performed to screen for morphological phenotypes in intact and regenerating worms. We found four ABC transporter genes resulting in animal lysis or pigmentation loss, suggesting a subset of transporter genes have vital roles in maintaining tissues like the epidermis. To examine the spatial expression transporter genes, we exposed planarians to irradiation depleting the neoblast population, and processed them for WISH. Seven ABC transporters exhibited reduced expression post-irradiation indicating a neoblast population. Together, these experiments provide the first insight into the tissue distribution and function of *S. mediterranea* ABC transporter genes, which could be translated for targeting ABC transporters in parasitic flatworms. Future experiments will investigate how RNAi knockdowns of ABC transporter genes impact specific cell populations using cell type-specific markers and

ABC transporter-specific small molecules to assess how our loss-of-function experiments abrogate the transporters.

### 173 12:25 am

#### Stem Cell and Gene Therapy for Friedreich's Ataxia **Angelyn Solis, Bachelor of Sciences in Biology (U)**

Friedreich's Ataxia (FRDA) is an inherited, autosomal recessive multisystemic disorder caused by a GAA trinucleotide repeat mutation in intron 1 of frataxin (FXN). FXN is a mitochondrial protein responsible for iron metabolism and the organelle's homeostasis including energy production primarily in the heart, liver, spinal cord, pancreas, and skeletal muscles. As a progressive disease, patients display gait and locomotor decline with cardiac dysfunction as the cause of mortality. There is currently no permanent treatment although an oral pill, Omaveloxolone, was approved by the FDA in February 2023 as the first treatment for the disease. As an alternative one time therapy, my research project focuses on evaluating the potential of gene therapy and bone-marrow hematopoietic stem and progenitor cells (HSPCs) transplantation for FRDA.

Previous studies in our lab showed that bone marrow HSPCs from wild type mice transplanted into Friedreich's ataxia diseased mice prevented progression of neurologic and cardiac complications. The beneficial effects were attributed to engraftment of HSPC-derived macrophages and microglia cells in the diseased organs because they helped transfer functional frataxin. We next demonstrated that a CRISPR/Cas9 mediated excision of the GAA mutation in FXN of HSPCs restored their mitochondrial functions. My research project evaluates the therapeutic potential of transplantation of these gene corrected HSPCs cells in FRDA mice. To this end, we explant organs from mice that were treated with or without the gene edited HSPCs and compare FXN protein levels to see if the edited cells helped to provide a rescue in the diseased mice. With this study, we will demonstrate whether increased frataxin helps to rescue the primary affected organs and conclude that HSPCs and gene therapy can be a potential therapeutic option for Friedreich's Ataxia.

## Session B-4

Oral Physical and Mathematical Sciences 1

**Friday, March 1, 2024 11:00 am**

Visionary Suite

### 174 11:05 am

#### Developing a Long-Range Optical Oil Spill Detector Using Fluorescence

**Faith Poutoa, Physics (U)**

The early detection of oil spills is crucial for minimizing their environmental impact. In this project, we have developed an optical-based system designed to detect the presence of oil slicks, with the intention of installing it on the side of an oil rig. This optical system relies on ultraviolet (UV) fluorescence, where UV light is absorbed by the oil, causing it to fluoresce

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at a different wavelength. The optical design software, Zemax, was used to determine necessary optical components and their positioning to create a practical system. Through a combination of computer modeling and experimental measurements, we have created a system that precisely focuses a UV LED into a one-square-meter spot at a target distance of 60 meters. We have rigorously tested the system with various oil samples in both well-lit and low-light environments, achieving remarkably high signal-to-noise ratios. In this presentation, I will delve into the key features of our prototype's design while also sharing our most recent results.

### 175 11:25 am

#### Plasmonics and hBN

**Jennifer Brumley, Bachelors of Science/Physics (U)**

Quantitatively comparing photoluminescence and Raman spectroscopy of gold coated and non-gold coated silicon wafers of which both contain hBN crystals with negatively charged boron vacancies (VB<sup>-</sup>). The purpose of this project is to demonstrate how the addition of gold plasmons to these wafers can alter the photoluminescence and the Raman spectroscopy of the hBN samples. The process of which includes depositing a gold film on silicon wafers, exfoliating hBN crystals, transferring those crystals to the wafers, annealing them to create negatively charged boron vacancies, and finally gathering and analyzing the data.

### 176 11:45 am

#### Plastic Wastes Upcycling via Electrocatalytic C-N Coupling Reaction

**Melanie Weed, Bachelor of Science in Chemistry (U)**

Polyethylene terephthalate (PET) waste is one of the most commonly used plastic materials due to its durability, low cost. Unlike natural polymers, PET waste is non-degradable under natural conditions, which causes severe environmental pollution. To solve this problem, current PET wastes are mainly recycled through mechanical and chemical methods. The inefficiency, high cost, and toxic reaction conditions of these conventional methods hinder the development of PET wastes upcycling. Electrocatalysis is an emerging strategy to achieve molecule conversion and synthesis driven by renewable energy sources. For example, ethylene glycol (EG) can be oxidized to formic acid on the anode while clean H<sub>2</sub> fuel can be produced from cathode in an electrochemical cell.

Herein, we developed an electrocatalysis method to achieve PET plastic wastes upcycling. In this research, the low-cost MnO<sub>2</sub> was synthesized as a catalyst through a facile electrodeposition method. On anode, the EG monomer from PET hydrolysis reaction was efficiently oxidized to aldehyde intermediates in near-neutral condition, which further coupled with nitrogenous nucleophile to produce C-N bond compounds, such as formamide and glycolamide. Meanwhile, clean H<sub>2</sub> is produced from cathode. Overall, this research develops a novel method to upcycle plastic wastes to value-added products, which is an attractive "Tuning Waste to Wealth" strategy.

### 177 12:05 am

#### An ab initio investigation of the energetic properties of HC<sub>3</sub>O radicals

**Molly Hedin, Biochemistry (U)**

HC<sub>3</sub>O free radicals are highly reactive  $\pi$ -conjugated combustion intermediates. The reactivity of free radicals is a driving force of chemistry, yet the same reactivity greatly limits the availability of experimental data. Because of this transient nature, ab initio computational methods have been employed to study the energetics of HC<sub>3</sub>O reactions. Previous studies have found two minima along the potential energy surface, corresponding to different isomers of HC<sub>3</sub>O: isomer A with the form H-CC-C=O and isomer B with the form H-C=C=O. The unpaired electron on isomer A is on the carbon bonded to the oxygen, whereas on isomer B the unpaired electron is on the carbon bonded to the hydrogen. This study investigates the energetic properties and reactivity of these isomers using electronic structure calculations carried out with the quantum chemistry program Gaussian, which provides solutions to the Schrödinger equation. Single point energies were calculated using the computational methods DFT-B3LYP and QCISD with the basis set cc-pVDZ. The optimized geometries and vibrational frequencies were found at the critical points along the potential energy surface, and from there, an analysis of the activation energies was completed. When comparing the relative energies, we found that isomer A is lower in energy and more stable than isomer B by 11.1 kJ/mol. To understand the reactivity of these molecules, the reactant carbon monoxide was used. The activation energy E<sub>a</sub> for isomer A + CO is 75.1 kJ/mol and the change in free energy from reactants to products is  $\Delta_{rxn} G = 61.6$  kJ/mol. For isomer B+CO activation energy E<sub>a</sub> is 99.4 kJ/mol and the change in free energy from reactants to products is  $\Delta_{rxn} G = -21.1$  kJ/mol. In comparison, the thermal energy of a typical combustion system at 1300 K is equal to 10.8 kJ/mol. Knowledge about the reactivity of HC<sub>3</sub>O radicals will provide key information and insight into the behavior of similar compounds in high-temperature combustion reactions.

## Session B-5

Oral Behavioral and Social Sciences

Friday, March 1, 2024 11:00 am

Park Boulevard

### 178 11:05 am

#### Caregiver Conflict, Screen Time, and Childcare Challenges: Unraveling The Effects of the Pandemic on Children's Vocabulary

**Matthew McArthur, Masters of Arts in Psychology (G)**

Early vocabulary supports the development of numeracy, literacy, executive function, and social-emotional skills (Duff, 2015; Purpura, 2011; Schmitt et al., 2019; Sparapani et al., 2018). This, in turn, supports kindergarten readiness, high-school achievement, and employment outcomes over ontogeny (Leffel & Suskind, 2013; Snowling et al., 2001;

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Armstrong et al., 2017). The COVID-19 Pandemic interfered with processes important to vocabulary acquisition, as research finds negative relations between pandemic-related disruptions and early vocabulary size (Davies et al., 2021; Kartushina et al., 2022; McGillion et al., 2023). Despite the potential for cascading effects, few studies have identified specific factors linked to vocabulary variability in children born during the pandemic.

Participants are 44 typically developing children (15F, Mage=26.98mos, Range=19 to 38) and their caregivers. Language and health characteristics were assessed using a demographic survey. To maximize representativeness, English and Spanish speaking families participated. Pandemic-Related Disruptions were measured via a Covid-19 Family Stressor Scale (Prime et al., 2021). Items were revised to capture changes to family organization and stability in income, anxiety, family relationships, and childcare. Vocabulary was assessed using the Web-CCT (Friend et al., 2023) and the ROWPVT (Martin & Brownell, 2011; Brownell, 2012) or the MCDI:WG (Marchman et al., 2023). To reduce method bias, raw scores were combined to form a language factor.

Correlation analyses controlling for age revealed significant negative relations between family and childcare disruption and vocabulary ( $r_{41} = -0.394$ ,  $p=0.009$ ;  $r_{41} = -0.31$ ,  $p=0.043$ , respectively) but no significant relation between income or anxiety and vocabulary ( $p>.05$ ). Relative weights analyses were performed to determine which survey items contributed most to these effects. For family-related disruptions, increased relationship conflict between caregivers, children's increased screen time, and feelings of overcrowdedness explained 25%, 22%, and 15% of the effect on vocabulary, respectively. For childcare disruptions, relying on a patchwork of childcare arrangements, being unable to access childcare, and not being able to afford childcare explained 30%, 19%, and 14% of the effect on vocabulary, respectively. This highlights specific areas in which families may need additional support during and after a crisis to maintain children's developmental progress.

### 179 11:25 am

From Enumeration to Empowerment: Visualizing and quantifying access to sanitation resources among San Diegans experiencing homelessness

**Adriana Rios, M.A in Psychology (G)**

Addressing homelessness is a multifaceted societal challenge that impacts marginalized individuals and vulnerable communities. The primary method used to assess homelessness is the Point-in-Time (PIT) count, a momentary survey that provides a snapshot of the homeless population. However, this approach has limitations, such as its inability to capture individuals temporarily staying with others, living in cars, or hidden in locations due to the transient nature of homelessness. Seasonal variations, regional methodological differences, and privacy concerns further affect the accuracy of PIT counts. The snapshot nature of the count also limits insights into the nuanced causes and needs of homelessness, impeding a comprehensive understanding. Recognizing these limitations, it is recommended that researchers and policymakers adopt a combination of methods and data sources to gain a more

thorough understanding of the issue. Accurate measurement of homelessness is crucial for efficiently allocating resources, identifying trends, and customizing assistance programs. The lack of reliable data poses challenges in providing timely and appropriate support, particularly concerning essential resources like sanitation facilities. The Project for Sanitation Justice (PSJ) focuses on identifying public restroom facilities in San Diego County, acknowledging their significance in supporting the health of the homeless population. This study aims to address methodological challenges in quantifying homelessness and develop targeted strategies to meet the basic needs of this marginalized population. Using Esri spatial products to map public restrooms, San Diego is deployed as a case study due to its recurrent public health crises linked to insufficient restroom access. Preliminary results reveal an average of 5.5 unsheltered individuals for every public restroom in San Diego County jurisdictions. To enhance homelessness counts, innovative data collection methods (e.g. standardizing methodologies of PIT, promoting transparency, technical support, Homeless Management Information System (HMIS) data, service-based surveys, post-enumeration surveys, or By-Name Lists (BNLs) for real-time visibility), increased collaboration, and the incorporation of lived experiences into research methodologies will be examined. The hypothesis is that integrating these approaches will contribute to a more accurate and holistic understanding of homelessness, facilitating the development of effective strategies to address basic needs and resources.

### 180 11:45 am

Seed-handling behaviors of the endangered moor macaque (*Macaca maura*) in Sulawesi, Indonesia

**Elena Williams-Moreiras, Masters of Arts in Anthropology (G)**

Animal-plant interactions are critical components of a healthy ecosystem. One major interaction is the dispersal of tree and plant seeds by dispersal agents such as birds, bats, primates, and/or other animals. Effective seed dispersal is dependent on multiple complex variables including seed-handling behaviors, habitat type/quality, distance dispersed from parent tree, quantity of dispersed seeds, and successful post-dispersal processes (i.e., germination and survival). The objective of this study was to examine the seed-handling behaviors of the endangered moor macaque (*Macaca maura*) to better understand their role as seed dispersers in Bantimurung Bulusaraung National Park, South Sulawesi, Indonesia. From July-November 2023, we conducted group scans lasting 10 minutes at 1-hour intervals to record the age-sex class, location, substrate, and activity of individuals in the well-habituated Group B. If the macaques were seen feeding between group scans, we conducted 15-minute focal animal samples to document their seed-handling behaviors. Seed-handling behaviors were categorized as: spitting, swallowing, dropping, transporting (when taken  $\geq 20m$  from the parent tree), cheek pouching, and destroying (biting, crunching). Sampling efforts resulted in a total of 135.1 hours of observation, including 325 group scans, and 346 focal animal samples. Preliminary results indicate *Macaca maura*'s diet to consist of 40% fruit and 30% provisioned food, with leaves, flowers, insects, shoots, and bark comprising the

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remainder. Seeds were primarily spit, accounting for 27% of unique seed-handling events, while dropping, cheek pouching, transporting, swallowing, and destroying comprised 22%, 21%, 11%, 10%, and 9%, respectively. These results suggest that *Macaca maura* exhibits seed-handling behaviors that facilitate effective seed dispersal for Sulawesi's forests, as seeds are often spit in-tact after fruit has been stored, processed, and transported via the individual's cheek pouch. Further analysis will examine how variables such as location (along the road versus in the forest), fruit species, and state of fruit ripeness influence seed-handling behaviors. Establishing these behaviors within an anthropogenic context facilitates future examination into the overall seed dispersal effectiveness and reliability of the moor macaque and may thus inform conservation strategies that consider both human and primate ecologies.

### 181 12:05 am

#### Where Are They Now? Reflections of Former Diverted Youth

**Anna Disser, Master of Social Work (G)**

Every year, hundreds of thousands of youth come into contact with the juvenile court system. Over half of these youth will be formally processed and adjudicated in the juvenile court system. Research demonstrates that juvenile system contact is associated with recidivism, poorer educational outcomes, greater association with other system-involved peers, future violent behaviors and offenses, and psychiatric disorders and substance use disorders. In contrast, community-based alternatives offered through informal processing (diversion) are generally less expensive and have lower recidivism rates than formal processing. There is an abundance of quantitative research analyzing the efficacy of these diversion programs in terms of their impact on recidivism. However, qualitative inquiry examining the programmatic elements of diversion programs and the way that participating youths receive them is limited. The present study examines the lasting effects and attitudes towards diversion through qualitative interviews with youths who previously completed a Los Angeles-based diversion program.

### 182 12:25 am

#### Facilitating picture naming in people with aphasia: Not all semantic cues are created equal

**Preeti Rishi, PhD in Language And Communicative Disorders (G)**

Aphasia is an acquired language disorder frequently characterized by anomia, or word-finding difficulties. When treating anomia in people with aphasia (PWA), speech-language pathologists (SLPs) often utilize semantic-based therapies (i.e., Semantic Feature Analysis [SFA]) where SLPs cue and train PWA to describe semantic features and relationships of a target word to aid in its retrieval (e.g., use, appearance, category, association, etc.). However, it remains unclear which semantic relationships best support word-finding. Prior evidence has shown that healthy individuals name pictures faster and more accurately when cued with thematically-related words (words

that co-occur in events or scenarios; e.g., leash and dog) than with taxonomically-related words (words that share features and belong to the same category; e.g., wolf and dog). The purpose of our work is to explore the effects of taxonomic and thematic semantic contexts on picture-naming abilities in PWA and healthy individuals to further inform semantic-based anomia therapies for PWA. Eight PWA (mean[age]=61, SD[age]=16) and seven age-matched language-unimpaired participants (mean[age]=62, SD[age]=11) completed a picture-naming task in which they heard taxonomically- or thematically-related cued words overlapping the target picture to be named. All target pictures were presented with each type of cue. When pictures were paired with taxonomically-related cues, unimpaired participants demonstrated slower naming speed [ $t(1321)=3.03$ ,  $p<0.01$ ; average naming speed: 1059ms], and PWA made more naming errors [ $t(879)=2.39$ ,  $p<0.05$ ; error rate: 15%] as compared to when pictures were paired with thematically-related cues (unimpaired naming speed: 1012ms; PWA error rate: 11%). PWA made more errors in which they repeated taxonomically-related cues as opposed to thematically-related cues when attempting to name the target picture [ $t(879)=3.74$ ,  $p<0.001$ ], indicating increased interference from taxonomically-related cues. These preliminary results suggest that taxonomic contexts result in increased interference in picture-naming compared to thematic contexts across healthy individuals and PWA. Our findings have implications for semantic-based anomia therapies whereby SLPs are advised to cue and train PWA to produce thematically-related concepts rather than taxonomically-related concepts when experiencing word-finding difficulties. Data collection is ongoing and may reveal further nuances regarding the effects of semantic contexts on picture-naming in PWA based on lesion location and/or aphasia characteristics.

### 183 12:45 am

#### Student Leadership: Institutional Agents at Hispanic Serving Institutions

**Griselda Paredes, Ph.D. in Education with CGU & SDSU (G)**

While institutional agents are central in supporting Latinx/e student success at HSIs, the term fails to recognize the role of student agency in cultivating Servingness (Bensimon, 2007). Students' contributions are often explored within the literature through the limited perspectives of administrators, staff, and faculty, who portray their influence as the authority (Komives et al., 2011; Lerma et al., 2020; Logue et al., 2005). Higher education personnel do not solely hold the power, authority, and resources required to support minoritized student populations. In fact, students have meaningfully contributed to the trajectory of serving minoritized student populations in higher education, often without support from institutional agents (Ayala et al., 2023; Cuyjet, 1994; Santa-Ramirez, 2023).

In recent decades, student leadership has garnered recognition for effecting institutional change on college campuses (Arminio et al., 2000; Kezar et al., 2017; Miller & Vaccaro, 2016). Yet, literature focusing on Latinx Student leadership at HSIs has predominantly focused on aspects of student development rather than examining the role of student agency in fostering

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servingsness (Astin, 1999; Komives et al., 2011; Rosch & Collins, 2017). Emerging literature has highlighted valuable student-led initiatives at HSIs (Aguilar-Hernández et al., 2021; Desai & Abeita, 2017; Licón, 2018). While these student-led efforts demonstrate the valuable work of Latinx student leaders at HSIs, these studies do not explore these contributions through a Servingsness lens.

Given the unexplored yet demonstrated impact of student agency at HSIs, there is a dire need to explore students' contributions as institutional agents through a lens of Servingsness. This literature review aims to center the conceptual model of Servingsness to justify the inclusion of students' roles as institutional agents. Thus, the presentation is guided by the following research questions:

- How do students' unique contributions promote servingsness at HSIs?
- How do students' contributions fulfill the defined role of Institutional Agents at HSIs?
- How do students' contributions compare to those of institutional agents?

## Session B-6

Oral Biological and Agricultural Sciences

Friday, March 1, 2024 11:00 am

Pride Suite

### 184 11:05 am

Developing Animal Borne Accelerometry Tools to Quantify the Movement and Behavior of *Crotalus ruber* within the Coastal Sage Scrub

**Emma McAndrews, Ecology (G)**

Studying and observing animal behavior is necessary to understand the roles that species play within their ecosystems. Although it is possible to quantify patterns of activity and behavior through direct observation for some species, this method is not suitable for more secretive animals that are highly sensitive to the presence of human observers or live in dense, inaccessible habitats. In recent years, there have been major strides in developing biologging techniques designed to circumvent the challenges that arise when trying to implement direct observation of the behavior of cryptic or otherwise unobservable animals. One biologging method that is particularly promising in this area is animal-borne accelerometry, or the measure of an animal's body accelerations as a means of quantifying their behavior. Using this method in collaboration with the San Diego Zoo Wildlife Alliance, I am locally studying the behavior of the threatened red diamond rattlesnake, *Crotalus ruber*, in the California coastal sage scrub. Despite conservation concerns, little is known about the lifestyle of this species, and due to their preferred habitat and secretive nature, direct behavioral observations to collect critical behavioral data are not feasible. Therefore, the development of the accelerometry technique for use on *C. ruber* has the potential to greatly increase our understanding of their ecology, contributing to any future conservation efforts for

this species, and supporting the continued usage of this novel biologging technology in studying the behavior of secretive animals.

### 185 11:25 am

The Collective Movement Behavior of Sulawesi Moor Macaques (*Macaca maura*) in an Anthropogenic Environment

**Trinidad Joshua, Masters of Arts in Anthropology (G)**

How group-living primates come to a consensus about navigating their environment is a result of their decision-making processes, where overall decisions can be made by one or many individuals. Although decision-making has been examined in several primate taxa, it remains underexplored for primates living in anthropogenic landscapes. To shed light on consensus decision-making and flexibility in this process, we examined collective movement behavior in a group of wild moor macaques (*Macaca maura*) experiencing roadside provisioning within Bantimurung Bulusaraung National Park in South Sulawesi, Indonesia. Our goal was to determine whether individual characteristics (i.e., sex, dominance rank, and/or social network centrality) predict the likelihood of initiating collective movements and if the opportunity to receive food provisions along the road would alter these patterns. Using the all-occurrences method, we recorded the location, time, and identity of initiators and followers of each collective movement observed from April - June 2023. We observed a total of 61 successful collective movements. Initiation was distributed amongst most of the group, indicating partially shared decision-making. While sex was found to be a significant predictor of initiation overall, with males being predicted to initiate more often, dominance rank and social network centrality were not, only partially supporting our predictions. However, initiation may also be context-specific, as initiation in road-directed collective movements was better predicted by dominance rank, with higher-ranked individuals being more likely to initiate, while initiation in the forest-directed collective movement model was better predicted by sex, similar to what is observed in the overall model. Examining the decision-making processes in this species through collective movements can provide insight into how primates come to a consensus and the extent to which anthropogenic factors shape these processes.

### 186 11:45 am

Assessing the metabolic impact of toxoplasmosis correlating to immune response, parasite burden and the microbiome

**Caitlyn Middleton, Doctor of Philosophy in Biochemistry (G)**

Toxoplasmosis is a zoonotic disease caused by the protozoan parasite *Toxoplasma gondii*. The primary mode of infection is through contact with infected animals as well as through the ingestion of contaminated foods. Toxoplasmosis is strongly regulated by Type I immune responses. *T. gondii* infection is regulated by Type I CD8+ T cells which minimize the spread of the parasite. The parasite initially infects the small intestine and disseminates to nearly every organ in the body. To

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better understand disease pathogenesis, this study aimed to assess the role of parasite burden, tissue inflammation and the microbiome on the metabolic changes which occur upon infection. The tissue metabolism of eleven different sampling sites in C57BL/6 mice was compared during the acute and chronic stages of *T. gondii* infection. Overall spatial mismatches were observed between parasite location and metabolic perturbation, indicating a low correlation between parasite burden and metabolism. To assess the role of immune response, metabolic perturbation was correlated with kynurenine levels in each tissue. Kynurenine is induced by pro-inflammatory signaling and modulates immunity. There was a stronger correlation between metabolic perturbation and kynurenine in ten out of the eleven tissues compared to parasite burden. This indicates that metabolism is more strongly associated with local immunity. To assess the role of the microbiome, the cecum and large intestine contents were analyzed. Through random forest analysis, the most perturbed metabolite families were identified. Carboxylic acid families were most perturbed in both acute and chronic stages of the disease. This study sheds light on metabolic perturbation as a result of *T. gondii* infection across eleven tissues. This study is important as it highlights the host's metabolic response to parasite infection and the mechanisms that regulate these responses.

### 187 12:05 am

In-depth Exploration: Purification and Kinetic Study of WT and Mutant Human DNA Polymerase  $\epsilon$   
**Ashfeen Nawar, MS in Chemistry (G)**

In eukaryotic replication, DNA polymerase epsilon (Pol  $\epsilon$ ) synthesizes the leading strand of DNA. The catalytic polymerase domain carries out correct nucleotide incorporation, whereas the exonuclease domain excises any misincorporated base. Notably, mutations in Pol  $\epsilon$  have been implicated in various cancers, including uterine, colorectal, skin, and stomach. These tumor-driving mutants have not yet been well characterized kinetically. Here, we aim to optimize the expression and purification of hPol  $\epsilon$  using a truncated active form of the enzyme by testing different buffers and chromatography methods, such as affinity chromatography using cobalt column and size exclusion chromatography. We investigated different parameters, such as adding iron(III) chloride in the growth media and using two different *E. coli* strains to increase the activity and yield of the enzyme. We also designed and modified a new cDNA construct, which was successfully used to express active Pol  $\epsilon$ . To achieve better protein solubility and improve purification through affinity chromatography, we studied the use of ArgHCl in the cell lysis buffer. Finally, we investigated the kinetics of single nucleotide incorporation in a double-stranded DNA substrate by WT Pol  $\epsilon$  by conducting burst assay experiments using a rapid chemical quench. We observed an initial burst of product formation associated with single enzyme turnover followed by a slower linear phase corresponding to multiple enzyme turnovers in the steady state, typical of DNA polymerases. This will eventually lead us to the factors that drive genomic instability.

### 188 12:25 am

“What’s My Age Again ?”: Masculinity in blink-182’s Pop-Punk

**Maximus Miesner, Masters of Arts in History (G)**

The late twentieth century witnessed the rise of the punk-rock genre, with bands such as the Ramones, the Clash and the Dead Kennedys moving towards an edgier, more rebellious sound after rock went “main-stream” in the decades prior. As punk-rock established its notoriety in the 1970s and 80s, the 1990s popularized being “punk,” creating a new sub-sect deemed “pop-punk.” As it made waves, it forced several to question whether the genre “sold out,” by sacrificing its characteristic roots for radio plays and recognition. This presentation will focus on blink-182, a “pop-punk” band to emerge from this era, paying homage to artists before them, while paving the way for the genre into the twenty-first century. In analyzing relevant historiography, discography, oral histories and performances, I will argue that despite the often negative connotation surrounding “pop-punk,” blink-182 provides a valuable understanding of masculinity heading into the new century and demonstrates the influence of southern California youth culture on the genre.

### 189 12:45 am

Investigating the Biogeographic Barriers on the genetic landscape of *Eucalyptus moluccana*  
**Rosalinda Diaz, Bioinformatics (G)**

Climate change has become a growing concern over the last century as warmer temperatures have had several impacts on important ecological systems globally. One devastating impact that has been reported in several parts of the world is tree mortality. Warmer temperatures have led to increased droughts, causing a large-scale dieback of important tree systems due to low water availability and herbivory attack. One such system that has been affected is *Eucalyptus moluccana* (proposed subspecies: *moluccana*, *queenslandica*, *crassifolia*, and *pedicellata*). *Eucalyptus moluccana*, commonly known as grey box, is predominantly found along the eastern coast of Australia. This is a species of ecological importance that provides resources to a variety of species. Currently, it is facing challenges due to a psyllid outbreak. This outbreak has led to a large dieback of the grey box in the Sydney region that has only affected populations from *E. moluccana* sbsp. *moluccana*. There is concern that if the outbreak were to spread outside this region, that could affect the other proposed subspecies of *E. moluccana*. My primary objective is to investigate the genetic diversity of *E. moluccana* between subspecies, and between populations within subspecies. Secondly, I aim to ascertain whether the divergence of the subspecies can be attributed to biogeographic barriers. I hypothesize that the genetic diversity for *E. moluccana* will be high irrespective of subspecies or population. Additionally, I posit that the emergence of the St. Lawrence Gap aligns with the divergence time of the northern subspecies *E. moluccana* sbsp. *crassifolia* and *E. moluccana* sbsp. *queenslandica*. Furthermore, I predict that the formation of the Brisbane Valley Barrier marks the separation

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of the southern subspecies *E. moluccana* sbsp. *moluccana*. Population genetic estimates like the inbreeding coefficient ( $F_{is}$ ), genetic structure ( $F_{st}$ ), and observed heterozygosity ( $H_o$ ) will be used to assess genetic diversity between subspecies, and between populations within subspecies. Furthermore, fastsimcoal2 will test six different demographic scenarios to estimate times of divergence, migration rates, and effective population sizes for each subspecies. Measuring diversity and estimating the time of divergence is crucial for uncovering the evolutionary history of *E. moluccana*, providing valuable insights into the species adaptation to geographic barriers, and contributing to conservation efforts in the face of a psyllid outbreak.

## Session B-7

Oral Humanities, History, Literature, Philosophy  
**Friday, March 1, 2024 11:00 am**  
 Aztlan

### 190 11:05 am

To Make a Better World: Black Canadian Women's Transnational Activism in Print, 1986-1989

**Kayla Daniels, Masters of Arts in History (G)**

This research seeks to examine the role of Black Canadian women in local and global context through the lens of feminist organizing and thought as represented in the 1980s publication *Our Lives: Canada's First Black Women's Newspaper* founded by the Black Women's Collective in Toronto. As Black women in a formally multicultural yet deeply flawed society, it intends to uncover how a growing Black population sought to cultivate communal, diasporic, and transnational feminist connections through serial publication. Subverting perceptions of conventional women's magazines, *Our Lives* contributed to a political and social project of educating its readers by expanding their awareness of a vast array of global feminist issues such as childcare, education, and poverty that were significant to the welfare of women and their communities.

The importance of this work lies in its capacity to demonstrate the contributions of Black Canadian Women to Black feminist thought and activism. By recentering their work, we can imagine how alternative archives are created that document their lives and expand our understanding of the contours of global blackness and feminism.

Relying on the *Our Lives* archives, this research uses methods of textual analysis, post structural analysis, and feminist interpretations of standpoint theory to uncover the intentional and sophisticated ways that groups like the Black Women's Collective sought to raise consciousness and participate in political struggle in service of their communities and the pursuit of a better world.

### 191 11:25 am

Exile and Language: A Personal Appreciation of the Romanian Writer Norman Manea

### Anca Segall, MFA / English (Creativer Writing) (G)

Exile, having to leave "home," is the rejection of an individual by—or of— their country. It may be imposed externally by one's countrymen, or self-imposed on oneself. A shove out of the safety of the nest, exile negates all the benefits we associate with "home": warmth, a sense of belonging, being wanted and appreciated as part of the group or tribe. Individuals are forced into exile when home becomes unsafe, threatening to oneself and to one's children, hateful rather than loving. Since the pull of home is such a strong force, like gravity, or like a centripetal force, the counterforce of the push away from home must be much stronger, especially when the exile is self-imposed. Exile is running from familiar danger into and through a different, unknown danger in hope of reaching safety again. A large energy barrier must be overcome to reach safety on the "other side," new and "strange," away from one's family, friends, language, from everything one knew, or thought they knew.

Norman Manea (1936- ) is a Romanian writer who went through two exiles, the first to Transnistria (1941-1945), an exile imposed by Romania's fascist-led government, while the second, in 1986, to Germany and then to the US, was to escape the Communist personal cult-led government of Nicolae Ceau escu. In exile, his Romanian language served as a mobile home, a "snail's house" that provided comfort to the freed dissident writer.

Analyzing books, interviews, immigration documents, and letters, I compare Manea's journey and exiles to those of my parents, who lived through Romania's fascist and Communist periods at roughly the same time as Manea, and emigrated to the US in 1972. I use these case studies to draw parallels and contrasts between motivations and intellectual development, and how these affected the adaptation to a new home country. I also explore the role language played in adapting to a new country. My analysis highlights how totalitarianism marginalizes subgroups (in this specific case, Jews) and drives them to exile, and the role language plays in how immigrants adapt and integrate into new societies.

### 192 11:45 am

Dolores Huerta: Embodying Change

**Briana Betschart, Masters of Art in History (G)**

"¡Viva La Causa! ¡Abajo! Down with Fear! ¡Si Se Puede!" are all refrains that Dolores Huerta, co-founder of the United Farmworker's Union, employed during speeches and rallies held to garner support for the cause of migrant laborers. Huerta connected to her audiences by utilizing "call and responses" to engage her audiences, inviting them from being mere spectators to active participants. Huerta embodies the role of an activist for social justice. Much of Huerta's advocacy sought to garner support for her cause by inviting membership into the United Farm Workers. Her motivating philosophy is driven by the idea of individuals' power and that organizing those bodies can generate change. While her work largely focuses on the labor movement, it also encompasses broader intersectional struggles for social justice, including immigrant rights, women's rights, LGBTQ rights, and environmental justice. Huerta's role as an activist and community organizer was performed alongside

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her various roles, such as mother and Chicana.

My research forefronts Huerta's embodied activism. I argue that Huerta's efficacy as an activist was strengthened by bringing the various parts of herself to her Union and activist actions. Huerta became the co-leader of the most influential labor union for farmworkers while raising eleven children. Motherhood and activism were not separate endeavors for Huerta. Historians often privilege written or disembodied texts, limiting our understanding of the broader dynamics within our conscious minds and bodies. Embodiment Theory provides a deeper perspective of human behavior. I utilize Embodiment Theory as a lens to analyze Huerta's success as an activist. Embodiment Theory deconstructs the binary of mind vs. body to explore the dimensionality of experiences that can be felt and created through physical form. Dolores Huerta brought her whole self into her more than seventy-year career as an activist, and viewing her activism through this lens helps establish a greater understanding of her activism and accomplishments.

### 193 12:05 am

#### Sontag in Sarajevo: Regarding the Age of Mass-Mediated Atrocity

**Sara Romano, Masters of Arts in Liberal Arts and Sciences (G)**

As an intellectual, author, critic, and activist, Susan Sontag was a notable public figure in 20th-century American culture. She was an important contributor to the field of photography theory and its role in contemporary society following her 1977 publication *On Photography*. Her interest in and examination of the medium of photography continued throughout her life. Sontag's 2003 publication *Regarding the Pain of Others* is a meditative essay in which Sontag reflects on the purposes, effects, and ethics of visual depictions of pain and suffering, focusing primarily on the medium of photography. Regarding offers a complex contemplation of the ethics of viewing images that portray war, conflict, and human suffering.

This research examines how Sontag's thoughts on atrocity photography evolved from her initial work in the 1970s to her final work in the early 2000s. I argue that this shift reflected her transformative experiences in besieged Sarajevo during the Bosnian War, as well as her astute observations of the evolving modern media landscape following the rise of the internet and the 24-hour news cycle. All of which resulted in a more nuanced understanding of the ethical complexities of photography depicting human suffering. Drawing from interviews with Sontag and contemporary articles written by her, this research utilizes critical textual analysis and biographical criticism to reveal connections between Sontag's experiences and essays. Relying on both post-structural and psychological approaches to photography and the media, this study offers an interdisciplinary analysis of Sontag's opinions about atrocity photography.

While Sontag ultimately maintained that atrocity photography has an important role in society, she emphasized that there is an unbridgeable difference between viewing and experiencing. Her powerful meditation on why shock photography ultimately fails to prevent war and scholarly analysis of the media's depictions of violence and suffering is a critical contribution to media ethics, theory, and practice.

### 194 12:25 am

#### Illicit People vs. Illicit Acts: Vagrancy as a Social Constraint in Early American San Diego

**Thomas Pugh, Masters of Arts in History (G)**

Many illicit avenues operated in San Diego during the nineteenth century and studying them reveals important insights into how society operated during this period of flux. The nineteenth century was an incredibly tumultuous period in California's history. This research intimately explores San Diego's relationship to vagrancy, indentured servitude, and smuggling, three instances where illicit activity shifted the socioeconomic underpinnings of California. New laws and social constraints blocked non-Anglo communities from significant goods and services that were necessary to either their cultural survival or their inclusion into mainstream socioeconomic channels. Conflating this issue was the use of legal language to push stereotypes of Indigenous individuals as immoral vagrants and drunkards. Local San Diego authorities and courts became increasingly obsessed with defining and policing vagrancy, intrinsically tying discussions of vagrancy to discussions of illicit activity and race.

Historiography has yet to explore the deeply personal and social reasoning behind illicit activity utilizing modern historical reasoning and theory. References to these activities are in association with San Francisco and other large cities, ignoring the role and importance of rising cities, particularly in Southern California. Thus, this study argues that illicit activity needs to be redefined and re-evaluated to address issues of race, class, and gender. San Diego is a perfect case study for this analysis as it operates as both a cultural and a cartographic border. The increased attention to defining and addressing the U.S. Mexico border during this period suggests that illicit activity was influenced more by sociopolitical racism than by law and order. Identity, race, capitalism, and gender collided in San Diego to create a geographic and cultural borderland. Statehood in 1850 did not create this borderland, but it did complicate it profoundly. Explicating why and how people engaged in these activities reveals how social life operated in nineteenth century California, the effectiveness of the new laws and ordinances, and positions San Diego as a vital borderland.

### 195 12:45 am

#### The Aesthetics of Skateboarding

**Hector Quintero, Masters of Arts in Philosophy (G)**

Skateboarding emerges in the 1950s as surfers in California attempt to recreate the experience of riding a wave on land. The impetus to recreate such an experience finds parallels in the work of John Dewey. Dewey states that aesthetic experience is built on natural experience. He argues that our natural experience of the world involves a fundamental relationship that connects us to our environment, mainly survival (what he calls 'rhythm'). Once we are attuned with our natural experience, the aesthetic experience emerges as a product of our imagination as a way to enjoy those things that are beyond natural experience. For Dewey, art resides in our aesthetic experiences, and this may include philosophy and skateboarding. Although Dewey said nothing about it, skateboarding qualifies as an

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aesthetic experience because it is a creative venture that seeks to express the internal qualities of the skater. I explore and explain Dewey's naturalism and "internalism" and how these apply to his philosophy of art and provides strong evidence demonstrating that skateboarding is indeed by Dewey's criteria a creative art. Naturalism and internalism are technical terms that are defined by the relation that the aesthetic and natural experience share. Naturalism is defined by our common or ordinary experience of the world. Internalism, in contrast, claims that the aesthetic experience is one internal experience among many, yet it is one of the most significant and impactful.

## Session B-8

Oral Physical and Mathematical Sciences

Friday, March 1, 2024 11:00 am

Mata'yuum

### 196 11:05 am

Gravitational Waveforms of EMRI's with Eccentricity and Supermassive Black Hole Spin

Joshua Bardwell, Astronomy/Master's (G)

Extreme mass ratio inspirals (EMRIs) are binary systems consisting of a stellar mass compact object and massive black hole (MBH) that emit millihertz gravitational waves (GWs) for months to years. This makes them promising sources for future space-based millihertz GW observatories, such as the Laser Interferometer Space Antenna (LISA). LISA will rely on accurate simulations of EMRI gravitational waveforms to observe and characterize these systems. However, producing accurate EMRI waveforms is difficult, especially when considering eccentric orbits and MBHs with spin (known as Kerr black holes), often leading to the usage of kludge model approximations. Therefore, we wish to understand how well kludge models characterize EMRIs with rapidly rotating MBHs and their LISA signal-to-noise ratios (SNRs) in relation to more accurate, but computationally expensive, relativistic models. Furthermore, we use our approximate trajectory models to inform our more computationally expensive (and more accurate) models to calculate every possible trajectory an EMRI can experience. We present a method and model which pre-calculates gravitational waveforms templates for every realistic EMRIs with both eccentricity and MBH spin.

### 197 11:25 am

Limits on Circumbinary Planet Habitable Zones

Vladimir Bautista, M.S. in Astronomy (G)

To date, we have discovered over 5500 exoplanets, 14 of which orbit around two stars. A planet that orbits a binary star is called a "circumbinary planet." Both single-star and binary-star systems can have planets in their habitable zones; the planets must be at the correct distance from the star(s) to have a suitable climate for life. However, a distinct difference between a single-star and binary-star scenario severely limits the possibility of circumbinary planets existing in the habitable

zone: the critical instability radius. Interior to this radius, the time-varying gravitational perturbations from the two stars prohibit a planet from having a stable orbit. While the habitable zone and the critical instability radius depend on the stars' masses, separation, and eccentricity, their dependencies on these parameters are different and thus grow at different rates as these parameters increase. Therefore, the critical instability radius can exceed the habitable zone's outer (cold) edge. If so, the binary cannot host any planets in the habitable zone. In this research, we set out to find the fraction of binary systems that can host a planet in the habitable zone. We find that only about 2.5% of all binaries can have planets in the habitable zone. The critical instability radius also prohibits the existence of planets in the habitable zone around many short-period binary star configurations, especially those composed of M-stars. Given that most stars are low-mass stars, this restriction significantly limits the number of habitable planets in the galaxy.

### 198 11:45 am

Prediction of Delisting using a Machine Learning Ensemble

David Neuhaeusler, Master of Science in Statistics (G)

Delisting is the removal of a listed security from a stock exchange. Consequences of delisting are significant for the company and the shareholders. We develop a data-driven model to predict delisting using a wide range of features including company financial ratios and macroeconomic indicators. To our knowledge, there is no published work yet focusing on the prediction of delistings in the U.S. Our analysis is based on a data set with around 390,000 rows of quarterly financial ratios from numerous listed companies in the U.S. since 1970. The resulting model combines predictions of five base machine learning methods (logistic regression, random forest, gradient boosting, support vector machine and neural network), which makes the resulting ensemble model a powerful predictor. Performance metrics evaluate strengths and weaknesses of the five base learners as well as the ensemble model. Our ensemble model reaches a prediction accuracy of 81%, outperforming every base learner. Among the base learners, random forest and gradient boosting models show the best performance. Furthermore, we find that the price-earnings ratio is the most informative from a forecasting perspective along with cash ratio and inflation rate.

### 199 12:05 am

Light Travel

Alekhya Nagulapally Alekhya, Master's of Science in Physics (G)

This is about light travelling. In this we use light as a source of travelling. Here the phenomenon used in building this project is photo electric effect. It kinda works like a magic which moves an object from one place to another just by using light.

### 201 12:45 am

A Search for Circumbinary Planets in Kepler

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## Short-Period Binary Star Light Curves

**Margo Thornton, Masters of Science in Astronomy (G)**

Roughly 50% of sun-like stars belong to a binary star system: a pair of stars that orbit about a common center of mass. A total of 14 out of the 5500+ confirmed exoplanets orbit both stars of a binary. We refer to these as circumbinary planets. To date, all circumbinary planets (CBPs) have been identified around binary stars of orbital periods greater than 7.4 days, leaving open their existence around shorter-period binaries. We carefully examine short-period (~1 hour - 2 day) eclipsing binary (EB) systems using NASA's Kepler archival data to search for CBPs. Theory predicts that CBPs around short-period EBs should not exist. Our goal is to determine if such planets can be found in the Kepler data. The transit signature of a planet around a short-period EB differs significantly from that of a single star. Similar to CBP's around longer period binaries, the transits are not periodic, and they vary in depth and width from one transit to the next. However, short-period binaries have complex, multi-minimum eclipse shapes caused by the significant movement of the stars. Thus, conventional detection methods are inadequate for finding such transits. We modeled these effects to generate the complicated transits using the Eclipsing Light Curve (ELC) code. Of the 2920 EB's in the Kepler database, we selected 78 under the criterion of periods less than 2 days and 30+ days of short cadence data. The analysis involves applying a local template to each orbital cycle. The template is constructed from a fit to the local phase-folded light curve. A local template helps remove any contamination due to non-periodic phenomenon, like starspots. This analysis will carry over to the TESS mission, where the sample size will be much larger. With this, we can either help confirm theory or refute it should such a CBP be found.

## Session B-9

Oral Biological and Agricultural Sciences

**Friday, March 1, 2024 11:00 am**

State Suite

### 202 11:05 am

Quantifying structural differences between diverse species sperm midpiece segments using electron microscopy

**Alexander Price, Bachelor/Mechanical Engineering (U)**

Mitochondria found in mature sperm midpiece segments are the suggested power source for flagella motility and fertilization. As there is limited information regarding the pattern of distribution, shape and size of individual mitochondria across the Animal Kingdom, we have utilized a quantitative approach to analyze the helical structure and mitochondrial dynamics. Through SEM and TEM imaging, quantitative measurements were taken with Image J in order to identify distinctive patterns. Differences in sperm morphology may play a significant role in the production and transference of energy. The goal of this project is to model these potential differences in helical

structure, and to explore how these differences contribute to the transfer of energy from the mitochondria to the tail in species with internal or external fertilization methods. We posit that packing of the helix can be considered analogous to the elasticity of a spring. A stiffer spring will store a greater amount of kinetic energy, supplying sperm with an additional energy boost needed for fertilization. Measurements of the midpiece and mitochondria were taken and compared between an African Elephant and a Scrub Python as preliminary data to test our hypothesis. Clear differences in helical structure, surface area and overall midpiece length are evident. We plan to expand this analysis to multiple species from samples obtained through a collaboration with SDZWA.

### 203 11:25 am

Investigating Neoteny in Human vs Non-human Primate Derived Forebrain Organoids

**Joshua Pratt, Bachelor of Science in Biology (U)**

Neoteny can be defined as the retention of juvenile development within an organism. In comparison to humans, developmental differences in neoteny have shown to be faster across species such as nonhuman primates (NHPs). Brain organoids allow us to compare some features of brain development, granting a method to study neoteny across primate species. Using protocols developed by Dr. Guo-Li Ming's lab, we have generated forebrain organoids (FBOs) from human and nonhuman primate induced and embryonic pluripotent stem cells (iPSC and ESCs). FBOs are a valuable in vitro model for studying developmental processes, as they have the ability to recapitulate complex cytoarchitecture, neural network formation, and some features of neurological diseases. We have successfully generated FBOs from a diverse range of primate ESC and iPSC lines including humans, rhesus macaques, chimpanzees, bonobos, and marmosets. FBO generation was performed with the intention of investigating features of neoteny in humans compared to NHP-derived FBOs. qPCR analysis measuring gene expression revealed that the genes related to neural progenitor cell proliferation and synapse formation were upregulated at days 50 and 100, suggesting earlier cortical thickening and gyrification. Additionally, immunohistochemical analysis (IHC) was performed revealing an increase in GFAP+ astrocytes in NHP FBOs at day 70, suggesting earlier gliogenesis compared to humans. Additionally, there were more GABA+ neurons in NHP than humans at day 70, but have uniformity across each species by day 225. With GABA being an inhibitory neurotransmitter that plays a role in fine-tuning neural networks, this delay we see in humans could be a contributing factor to cortical complexity. These findings provide evidence for distinct developmental trajectories across human and nonhuman primate species.

### 204 11:45 am

Tri-trophic interaction: Two fungi and a pine tree

**Karina Cerda, PhD (G)**

*Pinus edulis* is a keystone species in the pinyon-juniper woodlands, an important ecosystem present in arid and

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semi-arid lands, that provides habitats for a diverse range of wildlife, playing a vital role in soil health and efficient carbon sinks.

In the roots of *Pinus edulis*, we can find a mycorrhizal association with a genus of fungi *Geopora* (an ectomycorrhizal) that has been shown to improve the growth and survival of pinyon pine seedlings in dry conditions, but, some species of this genus present opposite effects on the interaction with *P. edulis*.

An unprecedented fungus growth was found on the surface of the fruiting body of *Geopora*. This association among fungi is called fungicolous fungi, and it can have many different sorts of interactions, like indifferent, symbiotic, or parasitic. Combined with this association, we can determine a tri-trophic interaction between *Pinus edulis*, *Geopora*, and the fungicolous fungi.

In a previous work based on histologic sections and high-resolution photography, the observation of fungicolous fungi interactions was at the top of the sporocarp in *Geopora*. It showed a perithecium fruiting body that is nearly but not quite enclosed, telling us that this fungicolous fungi is part of the phylum Ascomycota.

The information on the fungicolous fungi's interactions with *Geopora* still needs to be clarified. We are focusing on identifying and describing fungicolous fungi growing in the genus *Geopora*, to get a better understanding of this tri-trophic interaction and comprehension of the consequences of changes in the environment.

To achieve our objectives, we have been working on morphological analysis, the after collection and preservation of samples, fixation and embedding in blocks of paraffin wax, cross-section cuts by microtome, staining, and observation of the samples using a microscope (Carl Zeiss). This will be supplemented by genetic analysis using Zymo-Quick-DNA Kits to obtain genomic DNA and use it for PCR amplification of conserved region ITS (Internal Transcription Spacer). We are expected to sequence the amplicone with Illumina NovaSeq 6000.

This research contributes to the fungus diversity and is the first step to understanding tri-trophic interaction among the pine trees, the mycorrhizal fungi, and the fungicolous fungi.

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## 205 12:05 am

### Predictors of cattle milk productivity in Rondônia, Brazil

**Elise Piazza, Master of Science in Geography (G)**

Our study works to better understand the effects of environmental variables and farmer management decisions on cattle milk productivity within the State of Rondônia, Brazil. We will test variables such as lithology (soil type), stocking density, and the use of fertilizer to identify to what magnitude each variable contributes to soil fertility and, therefore, milk production. We will use survey data collected by the Autonomous Entity for Technical Assistance and Rural Extension of the State of Rondônia (EMATER) and researchers from the study "Connections between Water and Rural Production: Sociohydrological Systems on a Tropical Forest

Frontier" (Project funded by the National Science Foundation: CNH-L #182504) and remote sensing data. Research questions include "how does soil fertility change within the different geologic zones?" and "which zones are more resilient to drought?"

## Session B-10

Oral Business Economics and Public Administration

**Friday, March 1, 2024 11:00 am**

Metzli

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## 206 11:05 am

### Mujeres en Lucha: Leadership and Political Participation of Indigenous Women Addressing Gendered Violence in Oaxaca, Mexico

**Jazmin Luna, MA Public Administration & MA Latin American Studies (G)**

The escalation of human rights violations in Mexico is reflected in the rising violence against women. This widespread violence has shaped the term feminicide (feminicidio), referring to the gender-based murder of women, coupled with widespread governmental impunity on a mass scale. Indigenous women experience higher levels of violence and feminicide, often made invisible by multiple intersecting factors, both direct and indirect. This research investigates Indigenous women's leadership strategies and political participation concerning gendered violence activism. Women from indigenous communities offer a unique perspective on collective leadership, political autonomy, and solidarity.

This study used a qualitative methodology. The research conducted eleven semi-structured interviews with Indigenous women to provide a nuanced understanding of their experiences. The findings of this research include 1) the unique positionality of Indigenous women in activist spaces; 2) Oaxaca's cultural context: customs, governance, traditions, and gender norms. Cultural context affects Indigenous women's decision-making and leadership; and 3) barriers Indigenous women face in policy, government, and non-government sectors. The purpose of this thesis is to understand how Indigenous women's leadership is vital to how we move forward in addressing violence against women. Indigenous women's liberation is transformative and transnational, it crosses languages and cultures. Recognizing the significant impact of Indigenous women, the thesis amplifies their voices, emphasizing their roles in reshaping societal narratives and advocating for justice.

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## 207 11:25 am

### Buying was so last season: persuasive effects of deinfluencers versus influencers on purchase intentions

**Allison Gennette, M.A. Mass Communication and Media**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

### Studies (G)

There has been academic research on social media influencing, positive and negative online reviews from movie critics and how they affect an individual's intention to watch the described movie, and the effect of celebrity vs. influencer endorsements on advertising effectiveness, measured by attitude toward the ad and purchase intentions. However, there is a lack of research conducted on deinfluencers, which are influencers telling their followers not to purchase a product for various reasons. This study aims to show how influencer experience may form higher levels of credibility, and in return, lead consumers to having higher purchase intentions (vs influencers without experience). This research seeks to advance scholarly comprehension behind the new emerging phenomenon that is "deinfluencing" to see if deinfluencers are more persuasive than influencers. The deinfluencing trend catapulted in popularity at the beginning of 2023. Being brand new, research on the topic is far and few in between, especially in academia. There is no current research on deinfluencing in the context of how credibility plays a role in consumer purchase intentions, especially within the TikTok beauty genre with Gen Z as the target demographic.

### 208 11:45 am

The Unheard Outcry: Feelings of Safety and Connectedness of Latinx, 2SLGBTQ+, and 2SLGBTQ+ Latinx Middle and High School Students in San Diego County Schools

**Carlos Carlos Pineda, Masters program in Dual Language Education and Critical Literacy (G)**

Latinx and 2SLGBTQ+ students are subjected to unacknowledged socially imposed norms in middle and high schools of San Diego County in California. On-line sources and studies focusing on underage students who self-identify as Latinx and 2SLGBTQ+ at the same time are limited. Public studies were examined in order to have a clear panorama about the conditions of both groups independently. For this literature review paper the resources created and/or conducted by the California Department of Education offers concise and abundant information focused on the conditions of BIPOC and 2SLGBTQ+ youth separately in the cities that structure this region, precisely San Diego County. Although the California Department of Education releases accurate information about the social conditions faced by BIPOC and 2SLGBTQ+ youth, there does not exist to date any public study focused particularly on youth who identify themselves as BIPOC and 2SLGBTQ+ adolescents together living in San Diego County.

### 209 12:05 am

Predicting Crime Resolution in Los Angeles  
**Anurima Saha, Big Data Analytics (G)**

In an era of increasing concern for public safety, the project tackles this problem through the lens of crime analytics. Our focus is on the city of Los Angeles. This project aims to use the power of data to have a better understanding of justice delivery at its root from the perspective of criminal arrest. The goal is the

creation of predictive models that could assess the probability of a crime case being resolved or unresolved based on specific features from the datasets. By immersing ourselves in the data of the city, the project led us to discover patterns, and trends, as well as identifying factors that impact crime resolution rates. The exploration of crime resolution is key for shedding light on the competence of law enforcement efforts.

Our work adopts a comprehensive approach, combining advanced analytics with visualization techniques while using Machine Learning. The data-driven insights have the potential to create awareness and provide guidance on proactive decision-making processes for individuals and law enforcement alike. Ultimately, this project aims to improve community safety initiatives by providing a data-driven approach that could facilitate strategic interventions.

### 210 12:25 am

The Economic and Ecological Impacts of Forest Management Reform: Evidence from the Forest Law Enforcement Governance and Trade Program

**Hattie Jenkins, Bachelor of Science in Statistics, Bachelor of Liberal Arts Economics emphasis in Public Policy, Minor in Interdisciplinary Studies (U)**

The existing research suggests that trade liberalization may generate negative impacts on the global environment via increases in deforestation. In an effort to combat these effects, the European Union has developed an international program aimed at improving forest governance and transparency in the timber trade and has made participation in this program a requirement for some free trade agreements. The program, known as the Forest Law Enforcement Governance and Trade Program (FLEGT), targets many countries with high rates of deforestation in Latin America, Africa, and Asia to curb illegal logging. To date, there has been little research studying the impacts of this program on forest loss and forest product trade among the eight countries currently participating in the program or in negotiations to adopt the program. In this paper we study the environmental and economic effects of FLEGT using satellite-derived estimates of forest loss across the globe, data on trade in forest products, and both synthetic control matching analysis and synthetic difference in differences. We analyze forest loss both country-wide as well as in sensitive ecological areas to see whether the undertaking of the FLEGT reforms reduces subsequent forest loss. Additionally, we study the impact of these reforms on timber product exports and economic growth.

### 211 12:45 am

Exploring Employment: A Personalized Empirical Analysis of Application Tactics

**Talia Finburgh, Bachelor's of Science in Business Administration: General Business (U)**

In the realm of job hunting, where new graduates often grapple with feelings of discouragement amid unanswered applications and rejections, this project emerges as an avenue of

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exploration. Focused on the quest for effective job application methods, the study navigates through diverse aspects, such as submission mechanisms and temporal patterns. Employing an empirical lens, the analysis unfolds with a practical focus, acknowledging the challenges of the job-seeking journey. With a recognition of the prevalent discouragement, this project aims to contribute insights that may empower individuals in crafting successful application strategies. While the findings emerge from personal observations with a limited sample size, the goal is to present a narrative that connects with the diverse and intricate aspects of professional exploration, ultimately streamlining the application process and increasing the likelihood of applicants securing interviews.



# Abstracts of Presentations

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## Session C

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session C-1

Oral Behavioral and Social Sciences

Friday, March 1, 2024 1:00 pm

Love Library 430

### 212 1:05 pm

Improving Continuity and Scale: Introducing the Spanish Web-Based Computerized Comprehension Task

**Diego Leon, Bachelor of Arts in Psychology (U)**

Early vocabulary plays a fundamental role in children's language and cognitive development. This development is important to track given its importance to long-term developmental outcomes (Leffel & Suskind, 2013). However, there are few vocabulary assessments for Spanish-speaking children beyond the first two years of life. Further, some Spanish assessments are direct translations from English jeopardizing their cultural relevance and developmental validity for children learning Spanish (Kester & Pena, 2002). This may limit the accuracy of the assessment for children learning Spanish as their first or second language.

Following the original Computerized Comprehension Task (CCT; Friend & Keplinger, 2003, 2008) and its expansions (Bleses et al., 2021 in Denmark, Gillen et al., 2021 in the UK, and Rosemberg & Alam, 2021 in Argentina), we extended this assessment to create the Spanish Web-Based Computerized Comprehension Task. The Spanish Web-CCT is a two-alternative forced choice automated procedure where the target-distractor pairs match on difficulty, semantic category, word class, and visual salience. Words were selected from the Inventarios del Desarrollo de Habilidades Comunicativas: Palabras y Enunciados (IDHC:PE, Jackson-Maldonado et al., 2003), IDHC-III (Jackson-Maldonado, unpublished), and an Argentinian Corpus (Rosemberg, 2015). The words were reviewed by native Mexican Spanish speakers for cultural appropriateness and relevance to our regional context. We designed the Spanish Web-CCT to estimate vocabulary from 18 months to 60 months of age, which improves continuity. The assessment is web-based, which improves scalability. We predict that scores on the Spanish Web-CCT will be positively associated with age, will correlate positively with the Receptive One-Word Picture Vocabulary Test Spanish-Bilingual Edition (ROWPVT-SBE; Brownell, 2012), will show good test-retest reliability, and finally, the items will evince high internal consistency.

We will present our findings on the psychometric properties of the Spanish Web-CCT. We ran a series of bivariate correlations and intraclass correlation analysis on our preliminary data. The Spanish Web-CCT showed the expected positive correlation with age ( $r_{17}=.600$ ,  $p=.008$ ), convergent validity with the ROWPVT-SBE ( $r_{12}=.848$ ,  $p<.001$ ), and good test-retest reliability ( $r_{11}=.771$ ,  $p=.003$ ). Finally, internal consistency of the instrument is excellent ( $\alpha=.974$ ). We plan to report on a full sample of 40 participants.

### 213 1:25 pm

Land Reform and Conflict: A Case Study of Colombia

**Max Moore, Bachelor of Arts in International Security and Conflict Resolution (U)**

The Colombian government's struggle to allocate land resources among diverse social groups has been curiously paired with an increase in violence in the country, despite a historic 2016 peace agreement between the Marxist rebel group Revolutionary Armed Forces of Colombia (FARC), and the Colombian Government. This paper aims to shed light on why violence in Colombia is surging once again. Through a critical analysis of past agrarian initiatives and an exploration of the multitude of social groups shaping Colombia's dynamics, this case study focuses on the intricacies of the country's struggles with equitable land distribution, a predicament that is amplifying existing ethnic tensions and elevating the potential for a return to widespread violent conflict.

### 214 1:45 pm

How does the fentanyl epidemic affect college students in the United States

**Malachi Lee, Criminal justice (U)**

The prevalence of drug use among college students raises significant concerns as it poses a multifaceted threat to their overall well-being, academic performance, and future prospects. The negative impact of substance abuse on this demographic is evident in increased health risks, compromised academic achievements, and potential long-term consequences that hinder personal and professional development. Addressing this issue is imperative for fostering a healthy, supportive college environment conducive to students' holistic growth and success.

Quantitative Analysis and Literature Review

We will analyze the effects substance abuse has on the college student population, along with its negative effects on a students physical health, mental health, academics, and social behavior. Are analysis will include research from multiple reputable sources and even from people who have experienced substance abuse for their first hand knowledge.

### 215 2:05 pm

Exploring multispecies associations among moor macaques, birds, and cows in Sulawesi, Indonesia

**Matthew Hall, Bachelor of Arts in Anthropology (U)**

This project explores the dynamics of community ecology within an anthropogenically modified habitat in the tropical forests of Indonesia. This inquiry delves into a 6-week fieldwork experience titled, "People, primates, and tropical forests: Integrated primatological and ecological research to advance human-primate coexistence and ecosystem health in Indonesia," funded by the National Science Foundation's International Research Experiences for Students program. Collaborative research, in partnership with scholars from

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San Diego State University and the Faculty of Forestry at Hasanuddin University, ensures a methodologically rigorous and multidisciplinary approach. The program involved two weeks of intensive training, both in the field and classroom, followed by approximately 40 hours of preliminary observations of endangered moor macaques (*Macaca maura*) at the field site in Bantimurung Bulusaraung National Park, Sulawesi, Indonesia. I then developed my own mini-project focused on associations between moor macaques and other animals present in their habitat, including two commensal bird species – malkoha (*Phaenicophaeus calyorrhynchus*) and srigunting (*Dicrurus macrocercus*) – as well as domestic cows. I used the scan sampling method to record the presence of macaques, the birds, and cows at 15-minute intervals from 08:30-18 on 5 days from July-August 2023. During these scans, I recorded key parameters including macaque age groups present, general group behavior, substrate preferences, and the visual presence or absence of these species. My analysis of the 75 scans collected revealed the malkoha were present in 4% of the scans, with 66% of their presence coinciding with moor macaque foraging. Srigunting birds were present in 12% of the scans, with 62.5% of their presence aligning with moor macaque foraging. Domestic cows were present in 8% of the scans, with 66% of their presence coinciding with moor macaque resting. These findings support previous research that found that malkoha birds may accrue feeding benefits by being in close proximity to macaques when they are foraging. Further research is needed, however, in order to characterize the ecological relationship between moor macaques, domestic cows, and srigunting birds.

### 216 2:25 pm

#### Liberating the Spirit: Queer Inclusion in African Diaspora Religions

**Hungerford Tiffany, Africana Studies, B.A. in Liberal Arts and Sciences (U)**

The African diaspora encompasses a rich tapestry of cultural, religious, and spiritual traditions that have evolved over centuries, shaped by the transatlantic slave trade, colonialism, and migration. Religious and spiritual practices thus play a pivotal role in the lives of Black people, fostering a sense of community, belonging, and connection to cultural heritage. Yet, the experiences of Black queer people show they may be confronted with challenges and tensions in the Black community that cause them to feel exclusion and disassociation. This proposed study asks: How do African diaspora religions and/or spiritualities accommodate the inclusion of Black queer people in their religious practices and communities, and how does this foster access to healing resources? The impetus for this research question lies in three closely related areas of scholarship. First, I explore the origin of anti-queer attitudes within the Black community, highlighting the role of White supremacy and Western hegemony in shaping these attitudes. Second, I examine the historical context of queerness in African culture and spirituality, arguing that anti-queer attitudes are colonial imports. Finally, I review healing practices in African diaspora religions and how they can

provide access to community and individual healing for Black queer people. This proposed study is designed utilizing focus groups and interviews and seeks to emphasize the importance of African diaspora religions as sites of cultural resistance to hegemonic discourses as well alternative visions of gender and sexuality that challenge Western normativity and provide a more inclusive framework for Black queer people. Ultimately, my proposed study aims to shed light on how such inclusivity fosters access to healing resources for queer people, offering spiritual support, community acceptance, and opportunities for personal growth and self-discovery, and how this contributes to the overall well-being and resilience of the Black community.

## Session C-2

Oral Biological and Agricultural Sciences

Friday, March 1, 2024 1:00 pm

Legacy Suite

### 217 1:05 pm

#### Exploring flavors of edible ants: A path to sustainable gastronomy and consumer acceptance

**Selene Alvarado Martinez, Bachelor of Science in Foods and Nutrition (U)**

Edible insects are gaining popularity as a sustainable protein source, owing to their low environmental impact and high nutritional value. However, solely emphasizing the

environmental and health advantages might be insufficient to encourage widespread acceptance. Investigating the flavor profiles of edible insects holds the potential to shift marketing strategies towards hedonic-focused campaigns that will be more successful in boosting consumer acceptance. Certain insects are already considered delicacies. For instance, Formicine ants are utilized as a sour flavoring agent in some cultures, and chicatana ants are highly favored in Mexican cuisine. To explore the flavor profiles of these edible ants, the volatiles of black ants (*Lasius niger*) and chicatana ants (*Atta mexicana*) were analyzed using headspace solid-phase microextraction and gas chromatography-olfactometry-mass spectrometry. Our study revealed distinctive odor profiles for different ant species. Black ants were characterized by a pungent, acidic, and vinegary smell primarily due to their high formic acid content, a secretion from their venom glands. Additionally, numerous Dufour gland alkanes such as tridecane, undecane, and pentadecane, known to act as alarm pheromones, were detected in black ants. In contrast, chicatana ants exhibited nutty, roasty, woody, and fatty notes. Unlike black ants, chicatana ants did not contain formic acid. Instead, they had alarm pheromone 4-methyl-3-heptanone and trail pheromone 2,5-dimethylpyrazine. The fatty aroma of chicatana ants was probably attributed to

their abundant presence of aldehydes such as hexanal, octanal, and nonanal. Understanding these flavor profiles is essential for creating appealing insect-based products that can overcome disgust-based aversions associated with insect consumption.

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**218 1:25 pm****Advancing Escher Web Tools for Dynamic Genome-Scale Metabolic Model Visualization****Julio Nunez Garcia, Computer Science (U)**

Genome-Scale Metabolic Models (GSMMs) are essential for the mathematical simulation and depiction of whole organisms based on their genomic sequences. These models incorporate a comprehensive array of biological components, including genes, enzymes, reactions, gene-protein-reaction associations, and metabolites. GSMMs find extensive use in fields like biotechnology and metabolic engineering, aiding in tasks such as drug target identification, metabolic pathway elucidation, phenotype prediction, and generating insights into metabolism in both healthy and diseased states.

A crucial aspect of GSMMs is their capacity for straightforward visualization of intricate metabolic pathways. Escher, a software tool, excels in this regard, offering a user-centric interface for pathway visualization and handling large datasets. Features of Escher include the modification and creation of bespoke reaction pathways, color customization, size adjustment, and annotation addition.

Additionally, Escher has been instrumental in the development of new GSMM visualization tools, including Escher-FBA and Escher Trace. Escher-FBA combines pathway visualization with Flux Balance Analysis (FBA) for estimating metabolic fluxes, whereas Escher-Trace focuses on the live analysis of stable isotope tracing.

However, the current Escher tools have their limitations, primarily in visualizing only single GSMMs. These constraints involve the representation of single organisms and a fragmented display of reactions. To address these issues, we have developed a new software that extends Escher's capabilities, enabling the visualization and selective filtering of reactions in community models. This software includes a script to read and sift through the uploaded model, subsequently displaying user-selected reactions. Furthermore, it facilitates the construction of tailored reaction pathways for community models within the Escher framework.

**219 1:45 pm****R132Q IDH1 sensitivity to reducing agents****Nicole Sierra, Biochemistry/Bachelor (U)**

The human enzyme isocitrate dehydrogenase 1 (IDH1), plays a critical role in maintaining redox balance and providing important cellular metabolites. In the normal wild-type oxidative decarboxylation reaction, isocitrate is converted to alpha-ketoglutarate with the reactant NADP<sup>+</sup> being converted to NADPH. However, tumor-driving mutations in IDH1 allow the mutant form to catalyze a neomorphic reduction, the NADPH-dependent reduction of alpha-ketoglutarate to D-2-hydroxyglutarate, D2HG, which can competitively inhibit alpha ketoglutarate-dependent enzymes. We have previously shown that the mutation R132Q produces high levels of D2HG while still being able to produce alpha-ketoglutarate, unlike other mutants. Furthermore, we previously solved a crystal structure of R132Q with the mutant bound to isocitrate and

NADP<sup>+</sup> substrates under reducing conditions to stimulate the cellular environment. This crystal structure led to the discovery of the reducing agent, TCEP, forming an adduct with NADP<sup>+</sup>. The impact of this adduct on the catalytic activity of the mutant IDH1 R132Q was unknown. We hypothesized that the NADP<sup>+</sup>-dependent normal reaction would be inhibited due to the unavailability of the NADP<sup>+</sup> substrate. We conducted steady-state kinetic assays with R132Q mutant at varying concentrations of reducing agents to determine the impact of the TCEP-NADP adduct on R132Q catalysis. We show that observed rates of R132Q decreased as concentrations of TCEP increased, while other reducing agents had minimal effect on catalysis. Overall, TCEP treatment led to a decreased Km, which was consistent with the NADP-TCEP adduct binding competitively with ICT. Discovery of this adduct led us to investigate the distinctive active site properties of IDH1 R132Q that allow adduct formation. We discovered the IDH1 R132Q active site was in a more catalytically-ready conformation compared to IDH1 R132H, the most common IDH1 mutant. The IDH1 R132Q active site was fully closed upon binding ICT while binding the TCEP adduct, alpha-ketoglutarate adduct, or alpha-ketoglutarate preserve the polar contacts that are near the active site. This work highlights the understanding of IDH1 mechanisms for identifying regions of inhibitory selectivity.

**220 2:05 pm****Herbivore-Induced Plant Volatiles Mediate Belowground Tritrophic Interactions****Scott Monahan, Bachelor of Science in Biology (U)**

Olfactory cues play an integral role in mediating belowground interactions where other senses are limited. Herbivore-induced plant volatiles (HIPVs) cue natural predators to the presence of prey and signal to conspecific herbivores the presence of intraspecific competition. In this study, we evaluated the role of HIPVs from roots of cucumber plants with herbivory by spotted cucumber beetles (*Diabrotica undecimpunctata*), in mediating tritrophic interactions among conspecific and heterospecific herbivores and their natural enemies, entomopathogenic nematodes. We predicted that regardless of herbivore species, HIPVs would attract natural enemies and deter herbivores as reported in previous research. We found that spotted cucumber beetle larvae avoided plants damaged by their conspecifics. However, the heterospecific striped cucumber beetle larvae had no preference for plants damaged by spotted cucumber beetles or undamaged controls, suggesting they did not detect or respond to root HIPVs for this species. In contrast to our expected predator behavior, the entomopathogenic nematodes, *Steinernema riobrave*, were not attracted to the spotted cucumber beetle damaged roots when compared to undamaged roots. Furthermore, we compared the composition of volatiles emitted by spotted cucumber beetle-damaged cucumber roots with striped cucumber beetle-damaged roots and found different overall blends of HIPVs in response to herbivory. Of these volatile blends, we identified 3 key HIPVs, camphene, -pinene, and sabinene, that differ among herbivore species. We found that while striped cucumber beetle larvae induced all compounds, spotted cucumber beetle larvae only induced -pinene, but at a much higher level. These

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results indicate that spotted cucumber beetle larvae induce species-specific volatile blends that only modify conspecific behavior. This suggests larvae could benefit by avoiding competition with conspecific herbivores and attracting natural enemies.

### 221 2:25 pm

Investigating the role of immune and developmental genes during bacterial-stimulated metamorphosis in the marine tubeworm *Hydroides elegans*

**Tatyana Ali, Biology/ Bachelor of Science (U)**

The immune system is one of the most critical yet complicated systems in the human body for its defense against microbes. Understanding host-microbe interactions is a crucial part of immune system development, as many developing organisms rely on bacterial interactions to educate their immune system. However, the immune system is difficult to study due to the interconnecting gene networks of complex organisms that are hard to tease apart. To better understand how microbes shape immune system development, we utilize a marine tubeworm *Hydroides elegans*. This organism's development is stimulated by the marine bacterium *Pseudoalteromonas luteoviolacea*. In this study, I examined the function and necessity of three different immune and developmental genes and transcription factors that are highly upregulated during this stimulation. The Von Willebrand Factor (VWF) gene coagulates blood clots in the human body, BZip is a crucial developmental transcription factor and Zinc Finger activates inflammation. Utilizing Hybridizing Chain Reactions, I localized these genes during bacterial stimulation and I am currently working to develop a protocol to knock them down via bacterial symbiote-mediated RNAi. After the knockdown of these genes, if no metamorphosis is present we will conclude its development relies on these genes. Identifying these genes' function in *Hydroides* can help add to the existing knowledge of the immune system as we identify vital information for disease prevention, medical treatment, and therapeutics.

### 222 2:45 pm

Identification of novel proteins that directly control TDP-43 Mislocalization in ALS

**Chloe Ferguson, Bachelor of Science in Biology (U)**

ALS is a neurodegenerative disease caused by the degeneration of upper and lower motor neurons, resulting in loss of movement, respiratory failures, and death. Around 10% of ALS cases are familial, resulting from a gene mutation in one of the many known genes, while the remaining 90% are sporadic. Loss of certain nucleoporins has been observed in 90% of patient-derived neurons (IPSNs) from sporadic cases. Pathologically, TDP-43 is known to be mislocalized to the cytosol in 97% ALS cases. However, molecular events that lead to this mislocalization are unknown.

In order to address that we have employed genome-wide CRISPR-based automated FAC sorting screens to identify genes that when knocked down, lead to TDP-43 cytoplasmic localization. This work would reveal the function of

uncharacterized proteins, but dissect their heretofore unknown mechanisms in regulating TDP-43. Collectively, our work will identify novel proteins that regulate TDP-43 cytoplasmic localization in human motor neurons in health and disease, which potentially can serve as new therapeutic targets for ALS pathology.

## Session C-3

Oral Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 1:00 pm**

Visionary Suite

### 223 1:05 pm

Stories of Foster Children: Issues of Identity, Liminality, and Struggle (Mid-20th Century New York City)

**Joseph Wiese, Triple Major: History, Sociology, Social Work (U)**

Children's stories are as absent from written histories as their voices. In part, this marginalization is due to the lack of available records that shine a light on children's realities. However, even records that center adults can offer glimpses into children's lives. Relying on the adult-centric sources I have available to me, I set out to reconstruct the experiences of foster children during the mid-20th century in New York City. This period was the inflection point when the percentage of foster children placed within home settings, as opposed to institutions, reached a majority. The results of this major turning point profoundly affected the most vulnerable and resilient children, yet, the few historians who have addressed this topic have largely made arguments that concern systems, structures, and institutions. That is to say, while they write about children, children are still just outside the focus; and even when they are addressed, they are treated as victims.

Shifting the focus away from the systems themselves, my research aims to answer how foster children asserted their agency and subjecthood in situations where they were made to feel powerless. Relying on graduate theses from the New York School of Social Work (1948) and Fordham University (1953) as my primary sources, I write narratives of foster children to demonstrate how they were agents of their own lives. In doing so, I illustrate the principal themes of their experiences, analyzing their narratives through the application of interdisciplinary social theory. I expand on issues of liminality, labeling, and intersectionality while connecting the children's lives to their broader historical context. Each story shines a light on what it was like to be a foster child in the mid-century, uncovering details about a child's personality, their struggle, and their victories. Through these narratives, it is clear how children are active in creating their own reality, rather than passively accepting the reality dictated to them by adults.

### 224 1:25 pm

Understanding the Elliptical Nature of Gender Discrimination, Sports, and Media: A

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## Communication-Oriented State of the Literature

### Alexander Tran, Communication Studies (U)

This state of the literature approaches the perception of gender inequity in athletics from a communicative scholarly perspective, utilizing commonly employed communication theories to piece together a unified analysis of the phenomenon; theories included social cognitive theory, muted group theory, and transactional media effects.

Articles citing structural communicative axioms were amalgamated to reveal an elliptical system within our perspectives of gender and athletics, divulging a cyclic model through which gender bias originates, establishes, and reinforces itself in Western societal understandings.

The analysis considered the issue from a top-down approach, looking at overarching gender constructs that alter the mass perception of sports and sports media, and a bottom-up approach where individuals are assigned responsibility for the differential nature of gender in sports.

Results formulated a hypothesis of four essential assumptions that highlighted the elliptical blueprint of athletic gender discrimination. (1) gender bias inherited from socially reinforced beliefs translates its prejudice into the domain of sports, (2) prejudiced beliefs are reflected in the media coverage of sports, (3) sports media activates gender-induced stereotype reactions among consumers, and (4) individual reactions to gender in media construe societal beliefs, reestablishing the first assumption. These suppositions established a scaffolding from which the cyclic hypothesis was built.

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### 225 1:45 pm

#### Making Art Museums More Accessible: The Laguna Art Museum, A Case Study

##### Crystal Choi, Bachelor of Art with an Emphasis in Art History (U)

Historically, art museums have been exclusive spaces dedicated to collecting, researching, and displaying art objects. Recently, however, some museums have shifted away from just acquiring and maintaining collections towards focusing on education and providing access to broader audiences. With this shift, these museums have begun to implement new protocols related to accessibility and inclusion. They are now beginning to assess the needs and experiences of their audiences more carefully. This has resulted in museums becoming more accessible to the public, especially through the incorporation of improved didactic and architectural features, such as using Braille on wall labels or integrating more ramps near stairwells. The goal has been to accommodate people of all backgrounds, including those who identify as members of the disabled community.

My presentation focuses on the Laguna Art Museum, located in my hometown of Laguna Beach, using it as a case study to assess the accessibility of our regional art museums. Even though I am an art historian, I use the social sciences method of field research (observation and notetaking) conducted on-site at the museum. My presentation first describes the museum's layout and explains how the building is structured through its

floor plans. Then, I describe the specific parts of its galleries and what the museum does and does not make accessible. Finally, I explain what other additions and changes the museum could make to improve its accessibility, underscoring the broader importance of accessibility in museum and exhibition design. I demonstrate that while the Laguna Art Museum's mission statement asserts that it is aimed at fostering audience engagement through its exhibition spaces, my assessment is that the museum is not fully accessible to all audiences. While the museum does offer a basic level of accessibility, overall, it is lacking in many other accommodations that would make it more accessible and engaging to audiences with a range of disabilities. Ultimately, through this research, I aim to show why it is imperative that museums include accessibility in their museum designs and how these changes can benefit all museum goers' experiences.

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### 226 2:05 pm

#### An Exploration of the Incel

##### Joel Varon, Philosophy (U)

Incels have been popular among online discourse in recent years and have become a prevalent part of our culture. Why is this? Since the Eliot Rodger attacks of 2014 near UCSB the mainstream coverage of Incel culture has maintained a looming growing among young men and boys. Through psychology we can explain case by case scenarios as well as try and map the behavior as a whole. But is there a philosophical explanation that may be able to encompass this seeming popular trend of hatred towards women and the feeling of being owed sex among men? This is what I will explore.

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### 227 2:25 pm

#### Book Talk: My Brilliant Friend

##### Sabine Ruiz, Liberal Studies Elementary Education (U)

This presentation was created for a book review project about famous female authors. The book presented in this project shows different important topics and hardships that young women face. The presentation has components such as symbols, themes, narrative styles, a couple of assignments that could be implemented into teaching a specific grade level, comparing the book to other books or films, and background information about the author.

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### 228 2:45 pm

#### "Aloha 'Oe": The Music of Queen Lili'uokalani as Cultural Preservation and Protest

##### Melia Miner, Bachelor of Science in Mechanical Engineering (U)

Queen Lili'uokalani of Hawai'i not only composed some of the most noteworthy songs of her nation, but also used music as a means of cultural preservation and protest during the time of Hawai'i's annexation to the United States. The research presented in this presentation examines Lili'uokalani's work as musical protest through the lens of "Aloha 'Oe," her most

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renowned composition. By examining Hawaiian culture, history, and musical tradition, as well as the life of Lili'uokalani and the political climate of her time, the significance of cultural tradition within Hawaiian musical protest of annexation becomes clear. Past research generally focuses on Lili'uokalani's compositions primarily in a political or historical context, however by examining the lyrics in the context of Hawaiian culture, Lili'uokalani's compositions and the legacy she left behind as a defender of tradition becomes clear. Lili'uokalani's music protests colonialism in explicit ways—numerous works were published while she was imprisoned by the colonial Provisional Government—but also in a more coded manner. By synthesizing traditional Hawaiian musical practices and Western styles of composition, Lili'uokalani's music appealed to a diverse audience of native Hawaiians and Westerners. Through her compositions, Lili'uokalani communicated ideas with a complex and sophisticated language subverting the belief held by missionaries and colonizers that the Hawaiian people were unevolved or “uncivilized.” In “Aloha 'Oe” Lili'uokalani crafted lyrics which may be interpreted to have multiple definitions. In the chorus of this composition alone, one may hear a heartfelt farewell, a kind greeting, or a message of love depending upon an individual's perspective. In a sense this is her greatest achievement of all—Lili'uokalani did not just use music as a medium of protest, but a vehicle of cultural preservation. Cultural references further emphasized messages of resilience within her music: that the Hawaiian people could persevere and flourish under a culture and tradition which was continually repressed.

## Session C-4

Oral Behavioral and Social Sciences

Friday, March 1, 2024 1:00 pm

Love Library 431

### 229 1:05 pm

Towards Transformative Justice: Envisioning Survivor-Centric Approaches Beyond Title IX for Addressing Campus Sexualized Violence at San Diego State University

**Vale Magana, Masters of Arts in Women's Studies (G)**

SDSU's lack of transparency was questioned in 2022 when the university faced national scrutiny for its delayed response regarding allegations of rape involving Aztecs football players and an underage victim. Against this backdrop, my research centers survivors' perspectives. By conducting interviews with survivors of sexualized violence, my research will use qualitative methods to investigate the efficacy of Title IX and university police as avenues of justice for survivors at San Diego State University (SDSU). I also analyze and interpret data from the SDSU Campus Climate Surveys, and also violence prevention education programs like The Brave Project that exist at SDSU. It also aims to understand how student survivors perceive the roles of key entities like the Title IX office, SDSU University Police Department, and other relevant SDSU bodies in (mis)

handling cases of campus sexual assault.

This research is a community-based articulation invested in a Transformative Justice (TJ) approach to campus sexual assault at SDSU grounded in the lived experiences of survivors. Understanding that the Title IX reporting process often fails at meeting survivors' immediate post-trauma needs, the heart of this investigation centers what TJ at SDSU could look like, imagined by those most impacted: survivors of campus sexualized violence. Using a theoretical framework of intersectionality and abolition feminist thought, my research seeks not only to critique Title IX as an extension of carcerality, but also to lay the groundwork for a more responsive, trauma-informed, and survivor-centric approach to addressing campus sexual assault based in the principles of TJ. My research works to contribute to the ongoing discourse surrounding the need for transformative change in addressing the pervasive problem of sexualized violence across university campuses.

### 230 1:25 pm

Exploring Student-to-Student Confirmation, Communication Apprehension, and Academic Self-Efficacy in (Post) Carceral Education

**Annika Wong, Masters of Arts in Communication Studies (G)**

There is currently a large increase in the number of incarcerated students who have access to education, however, there is minimal quantitative research on experiences of currently incarcerated students. The plethora of research on students who have never been incarcerated cannot be generalized to this population because of the differences that exist in their academic and life experiences. The following study seeks to examine whether there is a difference between students with conviction histories and students without, by collecting the same data from currently and formerly incarcerated students along with students who have never been incarcerated. Specifically, this study seeks to examine the relationships between student-to-student confirmation, classroom communication apprehension (CCA), and academic self-efficacy among currently and formerly incarcerated students along with students who have never been incarcerated. Survey results (N = 87) indicate that there is a negative relationship between student-to-student confirmation and CCA). Additionally, this study shows that, in regards to student-to-student confirmation, CCA, and academic self-efficacy, there is minimal difference between currently and formerly incarcerated students and students who have never been incarcerated. Future researchers should continue to study the differences that exist among currently, formerly, and never incarcerated students to fill the gaps in instructional communication research and provide knowledge that can better the quality of education that is provided to students with carceral histories. This study ends by outlining specific paths for future research.

### 231 1:45 pm

Exploring how Trust and Social Support Shape Housing-Insecure Youth's Health-Related

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Experiences During COVID-19

### Hannah Reynolds, Masters of Public Health (G)

Youth experiencing homelessness (YEH) are uniquely vulnerable to public health threats, leading to health and social inequities and impeding their healthy transition into adulthood. Additionally, they have relatively low health literacy—the skill set of obtaining, understanding, and applying health information. Yet, YEH are often excluded from public health interventions. This community-based participatory research (CBPR) study aimed to inform the development of such an intervention by examining housing insecure youths' preferences and needs during the COVID-19 pandemic. The community-academic team of expressive arts therapists, social providers, and academic researchers co-developed an arts-based engagement (ABE) qualitative data collection technique to engage with and learn from housing-insecure youth. Data were collected via ABE groups with N=21 YEH (ages 13-25) across six groups (n=5 English, n=1 Spanish). Groups involved two arts-based activities to elucidate participants' experiences during the pandemic and supplement their responses to a semi-structured set of questions related to COVID-19, social support, and health communication and literacy. All ABE sessions were recorded, professionally transcribed, and analyzed using applied thematic analysis to identify salient themes. Themes identified related to the importance of both strong social support networks and interpersonal trust within these networks. This was particularly important to the procurement of and adherence to health information. Participants cited that a lack of strong adult relationships negatively affected their ability to identify accurate health information. Notably, participants discussed that, although they find their health important, there are often multiple competing priorities related to their basic needs that take precedence over finding and adhering to infectious disease prevention guidelines. The results of this project indicate that future interventions to increase health literacy among YEH must be tailored and community-responsive. It identified that social support, perhaps peer-to-peer social support, may be an effective mode of communication for public health practitioners and community workers to inform YEH of pressing health information. Through this unique qualitative analysis, the YEH community's voices were amplified, reaffirming the importance of meeting their basic needs before aiming to address disease prevention and, further, promoting health equity.

### 232 2:05 pm

#### Exploring the Knowledge and Attitudes of Emerging Health and Human Service Professionals Regarding Sexuality and Older Adults

##### Jocelyn Smith, Master of Social Work & Master of Public Health with a concentration in Health Management and Policy Major (G)

Sex—a word that conjures a variety of feelings ranging from intrigue to discomfort. Yet, sex is recognized to be a vital aspect of personal expression, overall quality of life, health, and well-being. For many, sex is not only a way to express physical closeness, but also express emotional intimacy, loyalty, and self-confidence among other things. Nevertheless, in many

settings from popular media to healthcare, sex remains a topic of focus specifically for youth. Many stereotypes and ageist ideas around sexual health and older adults are pervasive in Western culture. These sexual ageist perspectives have major influences and implications for how older adults are treated in health and human service settings. Holistic, high-quality healthcare includes traditionally taboo topics like sexuality and sexual behavior in older adult populations. Thus, to address sexual ageism and provide holistic healthcare, it is critical to understand where these perspectives stem from. This study utilized the Ageing Sexual Knowledge and Attitudes Scale (ASKAS) to understand the current knowledge and attitudes about aging and sexual health of 400 students in the College of Health and Human Service at San Diego State University. The study collected background characteristics of students, including age, gender, race and ethnicity, level of education and scholarly major to compare how these traits impacted students' knowledge and attitudes about sexual health and aging. Additionally, statistical modeling was utilized to measure whether knowledge or these traits had an impact on the overall attitude of students. Consistent with extant literature, students had lower Knowledge Scores, but generally permissive Attitude Scores. Results of this study indicate that level of education, major and race and ethnicity had impacts on Knowledge Scores about changes and non-changes in sexual health as individuals age, while gender and age did not have a statically significant difference. Regarding Attitude Scores, all independent variables measured had an impact on the permissive versus dismissive attitudes of students. Based on this research, it is critical to approach interventions to address sexual ageism by addressing both systemic gaps in knowledge for students and individually by allowing students to address bias and stigma created due to personal backgrounds.

### 233 2:25 pm

#### When words collide: Impact of top-down and bottom-up input during bilingual picture-word matching

##### Laura Fitzgerald, Master of Arts in Linguistics (G)

Cross-linguistic activation enables bilinguals to retrieve cognates (i.e., words in different languages with phonological and semantic overlap) more quickly and accurately than noncognates. While this facilitatory cognate effect has been well-documented, prior research has not typically considered individual differences in language proficiency and cognitive ability. Additionally, greater understanding of cognate effects in the context of both top-down (i.e., picture naming) and bottom-up (i.e., word reading) input is needed. This study investigated how cognate effects differ when top-down and bottom-up input converges or diverges and whether these effects are modulated by linguistic proficiency and cognitive ability.

Forty Spanish-English bilinguals (ages 18-40) completed a picture-word matching task during which they saw a picture superimposed with a Spanish word and judged whether the name of the picture matched the text. There were six total conditions. Four conditions had unrelated text-picture

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pairings of cognate-cognate, noncognate-noncognate, noncognate-cognate, and cognate-noncognate combinations. Additionally, there were two identity conditions in which the word and picture matched. We predicted cognate effects for both top-down (i.e., implicit picture naming) and bottom-up (i.e., word reading) conditions. Further, we expected lower response accuracy and higher reaction times in the divergent noncognate-cognate and cognate-noncognate conditions. We hypothesized that the cognate-noncognate condition would be most challenging due to the co-activation of English through cognate text when retrieving a Spanish word with no connection to the English lexicon.

We observed a facilitatory effect of cognate status when comparing the two identity trials for both accuracy and reaction time. For the four unrelated conditions, we observed a main effect of cognate status on reaction times but not accuracy for both text and picture presentation dimensions. We also observed an interaction between text and picture dimensions in reaction times. Participants were slowest to respond when presented with noncognate text paired with a cognate picture. These findings suggest that bilinguals experience greater difficulty with word-retrieval when top-down and bottom-up input diverge, particularly when bottom-up information does not promote co-activation of both languages but top-down information does. These results will be compared to individual performance on cognitive and linguistic assessments.

### 234 2:45 pm

#### Exploring Graduate TAs' Perspectives on Equity in Professional Development

**Matthew Taylor, PhD Math and Science Education (G)**

STEM education exhibits significant inequities. Despite decades of efforts to enhance student success in STEM, issues such as low STEM persistence exist for women and students of color. Such challenges are often attributed to experiences in gateway mathematics courses like precalculus and calculus sequences (Ellis et al., 2016; Seymour, 2019).

One important avenue to address this issue is through the role of graduate teaching assistants (GTAs), many of whom will become future mathematics educators and nearly all of whom are crucial points of contact for undergraduate STEM students. Hence, GTAs need training in teaching practices associated with equitable learning outcomes (Theobald et al., 2020). However, GTAs receive little to no training on pedagogy (Deshler et al., 2015; Speer et al., 2017), let alone equitable teaching practices. Consequently, there is a need for professional development (PD) that attends to such practices. Furthermore, the impact and efficacy of such PD interventions must be understood.

This presentation centers around an initial activity in a two-semester-long PD course for GTAs, specifically targeting engaged learning, inclusive teaching, and equity. The activity involved groups of GTAs constructing a mobile using different materials - with some groups having access to more materials than others. After the activity, GTAs filled out a five-question reflection survey. We investigated how this activity prompted GTAs to think about equity. To this end, we analyzed the survey

responses of nine participating MGTAs using Gutiérrez's (2009) four dimensions of equity—access, achievement, identity, and power—while allowing for emergent themes.

The analysis revealed that access and achievement were the most prevalent themes in GTAs' written responses. However, additional themes of empathy and a growth mindset also emerged. This suggests that GTAs initially frame equity regarding students' access and achievements but are also attuned to the affective aspects of how these inequities may impact students. This analysis highlights the critical need for enhanced training for GTAs and provides insights into how a targeted PD course can influence their perspectives on equity.

## Session C-5

### Oral Biological and Agricultural Sciences

**Friday, March 1, 2024 1:00 pm**

Visionary Suite

### 235 1:05 pm

#### Tests of Ghost Introgression into Extant Lineages

**Wanjiku Wanjiku, PhD in Evolutionary Biology (G)**

Gene flow from unsampled or extinct ghost populations leaves signatures on the genomes of individuals from extant, sampled populations, often introducing biases, data misinterpretation, and ambiguous results when estimating evolutionary history from population genomic data. Here, we utilize extensive simulations under various ghost topologies, with no gene flow (Model 1) to extensive gene flow to and from an unsampled ghost population (Model 2, 3, 4, and 5). These models help us systematically assess biases while accounting or not accounting for gene flow from ghost populations in demographic history (mutation-scaled effective population sizes, divergence times, and migration rates) under the Isolation with Migration (IM) model. Estimates of evolutionary history across all scenarios of deep divergence of an outgroup ghost indicate consistent a) under-estimation of divergence times between sampled populations, (b) over-estimation of effective population sizes of sampled populations, and (c) under-estimation of migration rates between sampled populations, with increased gene flow from the unsampled ghost population.

Additionally, considering the large effects of gene flow from ghost populations, we propose a multi-pronged approach to account for the presence of unsampled ghost populations in population genomics studies to reduce erroneous inferences. We present three statistical tests to test for the presence of an unsampled ghost in population genomic data. They utilize (1) inference of population structure under the admixture model, (2) inference of the distribution of coalescent times across genomic loci, and (3) inference of the goodness of fit under the IM model to test for the presence of an unsampled ghost population among sampled population genomic data. We recommend these tests as a necessary first step before estimating evolutionary history under restrictive (e.g., two population) demographic models.

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**236 1:25 pm****The Role of the Drosophila Muscle Gene CG42319 in Muscle Development and Function****Ebru Robinson, Cell and Molecular Biology (G)**

Z-discs, fundamental elements of muscle structure, play a pivotal role in anchoring actin filaments using  $\alpha$ -actinin molecules. The Z-disc serves as a crucial anchoring point for thin filaments during muscle contraction. Consequently, discerning the constituents of the Z-disc is important to gain a comprehensive understanding of myofibril assembly and its functional mechanisms. While the complete structure and functions of mature Z-discs remain partially understood, they are thought to require numerous proteins for assembly and maintenance. Mutations in Z-disc-related proteins have been linked to myofibrillar myopathy (MFM), a group of heterogeneous chronic neuromuscular disorders. The Drosophila gene CG42319 is an ortholog of human PDZ LIM genes and is the focus of our study. We aim to elucidate the structural and functional role of CG42319 in Z-disc formation and function. Our research seeks to determine if the CG42319 protein is essential for the interaction between  $\alpha$ -actinin and the Z-disc in flight muscles, as well as for maintaining normal sarcomere structure. To investigate the function of the CG42319 gene further, we generated several mutant alleles using CRISPR/Cas9 gene editing technology, aiming to uncover the gene's underlying mechanisms. Our initial findings reveal that these mutant alleles markedly disrupt alpha-actinin structure, causing muscle dysfunction in the indirect flight muscles of Drosophila. Importantly, mutations in human orthologs (PLIM2) of this gene have been associated with severe muscle dysfunction and structural abnormalities observed in myopathies and muscular dystrophies. Our research holds the potential to advance our understanding of the PDZ domain protein CG42319 and its significance in the field of muscle biology.

**237 1:45 pm****The TWEAK-Fn14-NF- $\kappa$ B signaling axis enhances expression of integrin  $\alpha$ V $\beta$ 3 in a post-chemotherapy tumor microenvironment****Omar Lujano Olazaba, JDP PhD Biology (G)**

High grade serous ovarian cancer (HGSOC) patients initially respond to chemotherapy but a majority relapse with chemoresistant disease. Research supports that tumor-initiating cells (TICs), a subpopulation of drug resistant stem-like tumor cells, are responsible for facilitating relapse and therapies targeting these fecund cells may prolong remission. The tumor microenvironment (TME) plays a crucial role in therapy resistance, and tumor relapse. Chemotherapies have been shown to modify the stroma of the TME which may favor the survival of TICs displaying specific adhesion proteins. We and others have shown that NF- $\kappa$ B transcription factors RelA and RelB respond to signals from the ovarian TME to promote chemoresistance, and survival. Our results further show that RelA and RelB regulate expression of specific integrins. Recently we found that TNF-like inducer of apoptosis

(TWEAK), and its only known receptor Fn14, are enriched following chemotherapy, leading to survival of TICs. TWEAK also induces expression of specific integrins in ovarian TICs. Therefore, we hypothesize that NF- $\kappa$ B mediated integrin expression enables adhesion and survival of TICs to a chemotherapy modified extracellular matrix (ECM) to facilitate tumor relapse. Using magnetic activated cell sorting (MACS) for CD117+ TICs, we found enrichment for integrin  $\alpha$ V $\beta$ 3. Supporting a role for TWEAK-Fn14-NF- $\kappa$ B in mediating integrin expression we further show that integrin  $\alpha$ V $\beta$ 3, but not  $\alpha$ 5 $\beta$ 1, was significantly increased in CD117+ TICs in the presence of TWEAK and was dependent on Fn14. RNA-sequencing analysis of tumor cells grown in spheroid conditions with RelA or RelB shRNA knockdown relative to control, show ITGAV is dependent on RelA while ITGB3 expression is dependent on RelB. Taken together, our findings suggest CD117+ TICs have enhanced expression of  $\alpha$ V $\beta$ 3 and is further induced by TWEAK mediated NF- $\kappa$ B activity for adaptation to a stressful post-chemotherapy environment. Ongoing in vitro and in vivo studies are investigating the therapeutic benefit of targeting  $\alpha$ V $\beta$ 3 and  $\alpha$ 5 $\beta$ 1 in CD117+ TICs for prevention of adhesion and tumor repopulation following chemotherapy. These studies will uncover interactions between TICs and ECM through their unique expression of integrins and clarifies the role of NF- $\kappa$ B transcription factors RelA and RelB in regulating TIC survival in the post-chemotherapy TME.

**238 2:05 pm****Enhanced expression of the myogenic factor Myocyte enhancer factor-2 in imaginal disc myoblasts activates a partial, but incomplete, muscle development program****Elizabeth Trujillo, PhD/PhD Cell and Molecular Biology (G)**

The Myocyte enhancer factor-2 (MEF2) transcription factor plays a vital role in orchestrating muscle differentiation. While MEF2 cannot effectively induce myogenesis in naïve cells, it can potently accelerate myogenesis in mesodermal cells. This includes in Drosophila imaginal disc myoblasts, where triggering premature muscle gene expression in these adult muscle stem cells has become a paradigm for understanding the regulation of the myogenic program. Here, we investigated the global consequences of MEF2 overexpression in the imaginal wing disc myoblasts, by combining RNA-sequencing with RT-qPCR and immunofluorescence. We observed the formation of sarcomere-like structures that contained both muscle and cytoplasmic myosin, and significant upregulation of muscle gene expression, especially genes essential for myofibril formation and function. These transcripts were functional since numerous myofibrillar proteins were detected in discs using immunofluorescence. Interestingly, muscle genes whose expression is restricted to the adult stages were not activated in these adult myoblasts. These studies confirm a broad activation of the myogenic program in response to MEF2 expression and suggest that additional regulatory factors are required for promoting the adult muscle-specific program. Our findings contribute to understanding the regulatory mechanisms governing muscle development and highlight the multifaceted

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role of MEF2 in orchestrating this intricate process.

### 239 2:25 pm

#### Resilient Restoration: Drought Resilience Amongst Southern California Coast Live Oak Populations on Tribal Lands

**Alexandra Hoff, Masters of Science in Biology (G)**

The Coast Live Oak (*Quercus agrifolia*), is a model species to investigate the global problem of climate change-induced mortality of culturally significant trees on a local scale. As a foundational species, *Q. agrifolia* provides shelter and food for a variety of species as well as being a culturally significant food source to many tribal communities. This species has a large distribution throughout coastal California and northern Baja California, populated by its two varieties: *Q. agrifolia* var. *agrifolia* and *Q. agrifolia* var. *oxyadenia*. They can be distinguished by their distribution and trichome density. Unfortunately, this species is declining due to increased vulnerability to pests, disease, intense drought, high temperatures exacerbated by climate change. We collaborated with local Kumeyaay tribal communities, and researchers from UC Riverside, and the Climate Science Alliance as part of their larger conservation project 'Resilient Restoration'. We sampled *Q. agrifolia* acorns and leaf material from eight populations across southern California, including tribal reservation lands. Our first objective was to identify which varieties, populations and families of *Q. agrifolia* perform better under drought conditions. We predicted that trees from within the distribution of *Q. agrifolia* var. *oxyadenia*, where there is a hotter, drier climate, would be more resilient to drought. In a greenhouse drought experiment, we measured physical responses such as survival and growth. While our results did not show significant differences based on variety, we were able to identify populations with higher performance. Additional analysis is needed of drought performance by family and including other indicators such as stomatal conductance.

Our second objective was to assess levels of conservation concern through population genetic estimates. Based on our analysis of DNA (nuclear SNP data) from 7 sample populations, differentiation between populations and by variety was low. While levels of genetic diversity differed by population, there was not a significant difference by variety. These findings, along with traditional ecological knowledge and cultural practices, will be used by our tribal partners to inform conservation decisions and the drought tolerant trees that survived the drought experiment are being rematriated to restore the tribal lands they were collected from.

### 240 2:45 pm

#### The generation of an engineered HEK293T cell line bearing mutant NEMO incapable of binding to secondary binding site

**Sally Luong, Doctor of Philosophy in Chemistry (G)**

NF- $\kappa$ B is an inducible transcription factor that controls inflammatory gene expression. NF- $\kappa$ B essential modulator

(NEMO) is a necessary scaffold subunit of the Inhibitor of NF- $\kappa$ B Kinase (IKK) complex, which is central for the nuclear translocation of NF- $\kappa$ B to induce the inflammatory response and gene expression. Activation of IKK catalytic activity in response to TNF- $\alpha$  and other canonical inducers of NF- $\kappa$ B requires formation of linear polyubiquitin chains and their association with its NEMO subunit. Recent observations suggest that the IKK NEMO subunit, upon noncovalent association with linear polyubiquitin, mediates a second protein-protein interaction with a catalytic IKK subunit, IKK2, and "primes" the complex for activation. In order to investigate the direct involvement of NEMO in promoting catalytically active IKK, we have generated an engineered HEK293T cell line in which NEMO has been mutated to lack its ability to bind to the second protein-protein interaction site. The CRISPR prime editing system was used to mutate the HEK293T cell line and to introduce expression of GFP for selection via flow cytometry. The plasmids used to introduce the mutation were constructed through Golden Gate Assembly. Mutations were verified using Sanger sequencing and western blot. The mutated cell line shows a reduced and delayed response in NF- $\kappa$ B activation compared to the wild-type cell line.

## Session C-6

Oral Humanities, History, Literature, Philosophy

Friday, March 1, 2024 1:00 pm

Pride Suite

### 241 1:05 pm

#### The State of Affairs Surrounding Intersex Genital Mutilation & Gender Affirming Services in Karachi, Pakistan

**Sara Liaquat, Masters of Arts in Sociology (G)**

This research utilizes a narrative and discourse analysis to study the processes, practices, technical aspects and cultural politics of intersex genital mutilation and gender affirming services in Karachi, Pakistan. The aim of this project is to delve into the ways in which intersex genital mutilation and gender affirming services are perceived, performed, and experienced by the multiple stakeholders involved in them in Karachi. It examines the realities of people involved as patients, professionals, and activists in this process, and conscientiously moves away from the biomedical paradigm in favor of a post-structuralist lens. Utilizing Berger and Luckmann (1966)'s theory of social constructionism, it highlights the ways through which the medical community (an essential stakeholder of this field) internalizes, externalizes and objectivates a hegemonic narrative (focused on maintaining a rigid sex and gender binary, while othering anyone who falls outside of it) influenced by the patriarchal, heteronormative cultural and conventional Islamic discourses in Pakistan. Using a post-structuralist framework of agency in transgender and intersex identity politics, as well as Bourdieu (1990)'s theory of the habitus, it underscores how members of Pakistan's transgender community (along with some other stakeholders involved in this field), by adopting

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an alternative discourse (advocating for gender fluidity and destroying the gender binary structure) are dismantling the hegemonic narratives of Pakistan's powerful medical community. This is a political project that urges for the medical community's widespread sensitization and awareness towards transgender healthcare needs in Pakistan.

## 242 1:25 pm

### A Postmodern SMiLE

**Andrew Ginzel, Critical Studies in Music (G)**

The Beach Boys' unreleased album, SMiLE, was intended by songwriter Brian Wilson as a pinnacle of rock music and a "teenage symphony to god." Situated against the backdrop of Los Angeles' 1960s modernism, the songs associated with SMiLE marked a shift into postmodernist aesthetics in Los Angeles' popular music output. Envisioned as the follow-up to their acclaimed album Pet Sounds, the songs composed for SMiLE challenged the limits of pop music as an art form and moved away from the commercialized style associated with the music of Los Angeles in the 1960s. However, the album's troubled history, from being shelved to the release of the uncompleted album Smile, mirrors Brian Wilson's deteriorating mental health and cultural isolationism.

This research explores SMiLE in the context of the postmodernist styles of quotation, collage, meta-narrative exploration, cultural and americana aesthetics, and irony. This study explores SMiLE's departure from Los Angeles' modernist musical influences through historical context, as well as lyrical and musical analysis of songs from the 2011 Smile Sessions album, designed as a hypothetically completed SMiLE, including "My Only Sunshine," "The Elements: Fire (Mrs. O'Leary's Cow)," "Our Prayer," "Cabin Essence," "Heroes and Villains," and "Vega-Tables." It also investigates the impact of Wilson's deteriorating mental health on the project and subsequent isolation. This research lies at the intersection of musicological analysis and historical analysis.

The interplay between postmodernist ideals and the artistic journey of SMiLE reveals its lasting influence on the music and cultural landscape. The research illustrates how these musical factors shaped subsequent popular music in Los Angeles-based bands, reflecting the social and cultural landscape of the 1960s countercultural movement. This study also raises questions about the future utilization of these postmodern musical stylings in genres such as punk and alternative rock in the 1970s.

## 243 1:45 pm

### The Shining Nights of High Summer: Affect in the Composition and Performance of Art Song

**Nathan Villamor, Master of Music in Vocal Performance (G)**

Music and language are powerful mediums for emotion. Though affect has been studied in depth within and alongside each of these fields, it has only been recently that examinations turned to the arts' intersection in vocal music. The act of transitioning

an affect-laden poem (serving as an "object of power") into an equally affect-charged melodic line creates a conundrum for emotive interpretation. Adding the performer into the equation further complicates the matter for which source of affect should be the primary interpretation: the poet, the composer, or the performer? This study is an examination of how affect is "accumulated," "modulated," and shared through "synchrony" between the various levels of the creation and performance of an art song. The following project is a multi-stage and multi-discipline observation that closely reads James Agee's poem "Description of Elysium," harmonically analyzes the art song settings from Samuel Barber and Morten Lauridsen, and concludes with a real-world application of affect theory with interpretations of live performances of each song. This research is foundational for holistically understanding how affect works through the lens of vocal music. The field of vocal affect is ripe for further research, especially in regard to soloistic performance versus a collaborative singing environment. Both Barber and Lauridsen have versions of their song scored for choir. Is the affect changed between the art song and its choral counterpart through the addition of more voices and the cumulative affect harnessed by a conductor? This exploration into the relationship between affect and vocal music is just scratching the surface of "the shadows on the stars."

## 244 2:05 pm

### Voices in Harmony: Exploring Parental Dialectal Variations and First-Generation Children's Language Development in Multicultural Contexts

**Yassin ALHENNAWY, General Linguistics /Masters of Arts (G)**

In an increasingly interconnected world, the linguistic environment of multicultural families plays a crucial role in shaping early language development. This research explores the language development of first-generation children born to an Egyptian father and an Iraqi mother, raised in the United States, where the dominant language differs from that of the parents. Focusing on children aged 6 to 36 months, the study investigates how variations in parental dialects influence vocabulary, phonological features, and overall language proficiency. Building on foundational studies, the research draws insights from Mizrahi and Creel's talker identification, Myers-Burg's dialect-specific vocabulary impact, and Schmale et al.'s dialect variation in infants' word recognition. The study aims to contribute to sociolinguistics, inform educational strategies, and support multicultural families facing similar challenges. By understanding the linguistic nuances within these families, the research strives to foster inclusive educational environments and promote successful language acquisition in diverse sociolinguistic contexts. The study's hypotheses anticipate that parental dialectal variations significantly influence children's language acquisition, impacting proficiency in American English, speaking, and writing skills. The outcomes have implications for theoretical models of language acquisition and practical strategies for families navigating multilingual and multicultural environments.

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## 245 2:25 pm

Representation of Mexican protests and protesters against attacks on women: a CDA and transitivity analysis to uncover ideology conveyed by news outlets

**Ana Sofia Ana Sofia Montes Aguila, Applied Linguistics (G)**

Even though femicides and missing women in Mexico have been on the rise for over a couple of decades, it has not been until recently that women around the country have taken to the streets to protest violence against women. These protests have been covered by the media both nationally and internationally. Yet, the question still stands: how have these news outlets represented the Mexican feminist movement in their coverage of women-led protests against violence? There is a well-established research tradition in discourse analysis that examines ideology and the social construction of reality within newspaper reports. However, these analyses on newspaper reports of protests or of crimes committed against women have focused primarily on headlines. Therefore, this study aims to compare the body of articles from international news outlets and national news outlets, specifically The Guardian (UK), The New York Times (US), and The Washington Post (US), La Jornada (MX) and Proceso (MX) and their portraying of feminist protests in Mexico. With a focus on articles covering the feminist protest held in Mexico City on International Women's Day in 2021, the study employs Critical Discourse power dynamics, ideologies, and the influence of the political contexts of the articles. Critical Discourse Analysis examines how language and its context shape perceptions, while grammatical functional analysis decodes linguistic patterns to provides an in depth understanding of how we depict reality through language. The results highlight significant differences between the articles in English and those in Spanish in the use of material and verbal processes in reporting and their participants. For instance, the analysis of verbal processes reveal a preference for quoting protesters in the English language articles, suggesting a prioritization of the protesters' voices. In the Spanish language articles, on the contrary, no verbal processes belong to the protestors but rather to government officials. The preliminary findings point to a great difference in the role the news outlets give to the feminist protests in their reports.

## 246 2:45 pm

Melodrama Meltdown: How National Tensions over Legal Slavery Influenced the Characterization of Law and Justice in 1800s Melodrama

**Robyn Wilkinson, Masters of Arts in Theatre Arts (G)**

In 19th century America, the rising societal chaos that preceded the Civil War contributed to an increasing confusion in the messaging of the melodramatic genre. This confusion was notable, as melodrama was known for formula, rigidity, and strict moral messaging. Yet the phenomenon makes sense given that the inherent tension between law and justice was central to both the subject of legal slavery and the melodramatic form. Accordingly, the relationship between law and justice provides a useful lens from which to analyze the

text of early American melodramas. Law and justice went from being synonyms in Gothic melodramas to distinctly separate (often opposed) terms in later slave melodramas, reflecting the widespread societal discord regarding what was just and what was law. By examining melodramas in this way and understanding how the public was talking and thinking about law and justice in the Republican and Antebellum eras, we can better understand the role of melodrama in early American society, the social climate that led to the Civil War, and some of the deeper conflicts at the heart of American identity.

In my paper I take the following course of action to make my argument. First, I characterize the instructive nature of American melodrama and its role in American identity building, both socially and morally. I then show why justice and law are closely linked with the social and moral, arguing that this relationship is what makes justice and law a subject inherently involved in American melodrama. Next, I show changing views of law and justice leading up to the Civil War by analyzing two cornerstones of early American melodramas: William Dunlap's *Fontainville Abbey* (1807) from the Republican Period, and Dion Boucicault's *The Octoroon* (1859) from the Antebellum Period. Finally, I argue the importance of this method of analysis, as justice, law, and racism still lie at the heart of American identity today.

## Session C-7

Oral Physical and Mathematical Sciences 1

Friday, March 1, 2024 1:00 pm

Aztlan

## 247 1:05 pm

Exploring Defects and Isotopes effects Through Raman Signal in Hexagonal Boron Nitride

**Sancia Michael Tauro, Masters of Science in Physics (G)**

Hexagonal boron nitride (hBN) is actively in use for the research of single photon emission for quantum applications but boron has 2 isotopes and the difference between them cause different results for single photon emission. The defects created in hBN are the powerhouse of single photon emission and I will be observing the changes in it's Raman spectrum. The defects are created through various methods like electron beam irradiation, laser irradiation, Ion beam irradiation but I will specifically be using thermal annealing to induce them. The hBN samples will undergo mechanical exfoliation to acquire hBN flakes and thermal annealing to create defects in them. I will be comparing the Raman results of the hBN with isotopes with the natural hBN and the Raman results of samples that did and didn't go through defect creation. The observation and analysis of the data obtained will be presented.

## 248 1:25 pm

Exploring an Amalgam of Period Finding Techniques  
**Samantha Anger, Master's of Science in Astronomy (G)**

Our research is focused on comparing and combining several

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

well-known period-finding techniques. There are inherent strengths and weaknesses in each technique, depending on the morphology and noise character of the input time series data. By combining these techniques, a weakness exhibited in one method is hopefully mitigated by the strengths of another. To determine the best period, we start with the median period calculated from the different methods and apply a half/double period correction to each technique's best estimate, and then compute the mean of the results, omitting any outliers. To probe the effectiveness of these methods, We created sets of synthetic data based on three distinct time series: a sinusoid, a transiting planet light curve, and a radial velocity curve for an eccentric binary, and varied their periods relative to their duration. We then degrade the data in two separate ways: by increasing both the levels of Gaussian white noise and/or data gaps. For each method, the relative error of the period is displayed in a 2 dimensional grid, with axes of increasing noise and increasing data gaps. We compare the resulting images to gain a better understanding of which method is likely to work best, or worst, under the varying conditions. Our ultimate goal is to provide an automated tool for robustly measuring periodicity under a wide variety of realistic conditions.

## 249 1:45 pm

### A Search for Additional Planets in Kepler-16 and Kepler-34

**Patricia Spalding, Master of Science in Astronomy (G)**

Out of the fourteen eclipsing binaries known to host a transiting circumbinary planet, only two of them show strong evidence of additional planets, namely Kepler-47 and TOI-1338 (Doyle et al., 2011; Kostov et al., 2014, 2016, 2020; Orosz et al., 2012, 2019; Standing et al., 2023; Welsh et al., 2012, 2015). Analysis of transiting circumbinary systems provides an opportunity to study planetesimal accretion, migration, and secular dynamics of short period exoplanets in the context of binary star environments. This analysis not only helps us understand these unique systems, but allows us to better comprehend the formation and evolution of planetary systems as whole.

Here we present updated parameters for the Kepler-16 and Kepler-34 circumbinary systems. We use archival photometric data not available in previous characterizations, particularly new data from the TESS mission, increasing the time span of the data to over a decade. This increased time baseline gives us more sensitivity to small Eclipse Timing Variations (ETVs) caused by the planet. We use the Eclipsing Light Curve (ELC) photodynamical modeling code (Orosz & Hauschildt 2000) to update the solutions assuming a three-body model. We then add a second planet that orbits outside the known transiting planets to the model and explore parameter space with a hybrid code that combines features of a genetic algorithm and a nested sampling algorithm. We present our results and give limits on the mass of an additional planet as a function of its orbital period.

## 250 2:05 pm

### Influences of Tree Mortality on Fire Intensity and Burn Severity for a Southern California Forest Using

## Airborne and Satellite Imagery

**Nowshin Nawar, Geography (G)**

Wildland fires commonly occur in southern California and are agents of large-scale disturbance to forest and chaparral ecosystems. Pre-fire tree mortality may influence fire behavior and postfire burn severity, by altering the rate of spread and intensity of the fire due to the dead trees containing dry woody fuels and creating ladder fuels that enable crown fires in forests. The aim of this research was to use high spatial resolution (1.6 m) airborne multispectral orthoimages to detect and map pre-fire dead trees for a portion of San Bernardino Mountains, where the 'Old Fire' burned in 2003, and assess whether spatial patterns of fire intensity and burn severity coincide with patterns of tree mortality. Dead trees were mapped using pre-fire aerial imagery through a hybrid deep learning classified and manual editing approach applied to four-band visible/near infrared orthoimages and facilitated with Google Earth Pro historical images. Fire intensity estimates were derived from maximum apparent temperature values from FireMapper airborne thermal infrared imagery (6.9 m) captured during the Old Fire. Burn severity was mapped and analyzed using postfire Normalized Burn Ratio index maps derived from Landsat 5 satellite imagery (30 m) different. The degree of spatial correspondence between the dead tree density with fire intensity and burn severity was analyzed using graphical and statistical analyses. Preliminary results suggest a high degree of spatial association between the three variables in the context of the Old Fire. The initial findings suggest that areas impacted by pre-fire tree mortality were subject to high fire intensity, followed by severe burn effects.

## Session C-8

Oral Physical and Mathematical Sciences 2

Friday, March 1, 2024 1:00 pm

Mata'yuum

## 251 1:05 pm

### Assessing the Capabilities of a Real-time, Portable Fluorometer to Track Sewage Inputs in Urban Creeks

**Glorya Escobar, Masters of Science in Civil Engineering with a concentration in Environmental Engineering (G)**

Leaks in aging sewage infrastructure and overflows of septic tanks and sanitary sewer pipes have been identified as principal sources of fecal contamination in urban waterways and responsible for high fecal bacteria indicator (FIB) levels in beaches after rain events. While fluorescence spectroscopy has been successfully used to monitor anthropogenic, microbial sources of dissolved organic matter (DOM); this study finds that certain environmental and site conditions may limit the capabilities of portable fluorescence spectroscopy to locate sewage inputs. The fluorescence profiles of DOM compounds, including aromatic amino acids (e.g. tryptophan (ex285,em350)) and chromophoric dissolved organic matter (CDOM (ex325,em(420:480))), are well-documented, facilitating their

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identification. Previous storm water studies have demonstrated that sewage contains bacteria and other compounds that have tryptophan-like fluorescence, and that a strong correlation exists between tryptophan-like fluorescence intensity and the total aerobic bacteria counts and total coliforms during storm events. However, in this study, adequate regressions were not found for discrete samples collected at storm sewers and open channels located along three tributaries within two distinct watersheds in a densely urbanized environment. Subsequent laboratory experiments to assess the degradation of tryptophan and CDOM fluorescence showed a significantly more rapid degradation of fluorescence intensity in samples that were exposed to continuous light versus maintained in the dark, suggesting that hydraulic residence time in open channels and environmental conditions may be critical limitations when using portable fluorescence in spatial studies. This research attempts to characterize conditions in which portable fluorescence spectroscopy may not serve as a reliable measure of FIB in urban streams and has important implications for watershed managers faced with sewage contamination in urban environments.

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### 252 1:25 pm

Flow quality survey of the SDSU Low Speed Wind Tunnel test section using planar PIV

**Yuichiro Tobita, Masters of Science Aerospace Engineering, Aerodynamics (G)**

The San Diego State University Low-Speed Wind Tunnel, built in 1961 has been used by many students and faculty members over time for conducting research projects and for carrying out instructional labs for students. Classic methods of wind tunnel flow quality characterization involve using a pitot rake array and turbulence sphere, which could characterize mean flow uniformity and estimate the turbulence factor, respectively. However, classical methods fall short of the ability to measure the lateral velocity components and the Reynolds stress distributions across the wind tunnel test section. In this research, Planar Particle Image Velocimetry (PIV) technique is used to measure the flow velocity and Reynolds stress distribution across the wind tunnel test section. Sample regions of the measurement include the wind tunnel's freestream flow region and the wind tunnel's wall boundary layer. The freestream speed of the tunnel for the measurements is set to be 45m/s, which is the same speed to be employed for the experiment with the Prandtl-D flying wing. PIV image processing will be carried out using LaVision's DaVis 10 software, with which the PIV image pairs captured from the experiment can be processed to obtain the velocity vector field based on the measured displacement of the seeding particles. In the experiment, the distributions of the time-averaged flow velocity, the Reynolds normal and shear stresses, and the turbulence intensity profiles in the wind tunnel test section will be obtained. The empty wind tunnel test section flow survey will not only enable a detailed quantitative assessment of the freestream flow quality of the SDSU wind tunnel test facility, but also provide the needed initial flow conditions for carrying out numerical simulations of the flow past the experimental models such as the Prandtl-D flying wing.

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### 253 1:45 pm

A Search for Circumbinary Planets Using Recent TESS Data

**Erika Dunning, Masters of Science in Astronomy (G)**

About half of the stellar systems in the Milky Way galaxy have two stars (the binary star systems) or sometimes three or more stars (e.g. triple stars, quadruple stars, etc.). In spite of the large number of binary systems nearby the Sun, the vast majority of the ~5500 known exoplanets reside in single-star systems. Presently, there are less than two dozen known exoplanets that orbit a binary star system---such planets are known as circumbinary planets (CBPs). NASA's Transiting Exoplanet Survey Satellite (TESS) is conducting a comprehensive all-sky photometric survey to find planets via the transit method: if the exoplanet has a nearly edge-on orbit about its host star (or host binary star) as seen from Earth, then that planet will block a small part of the light from the star every orbit as seen from Earth. We have begun a project to find signatures of CBPs in the TESS data, and in this presentation we will outline the methods we use and give a progress of the results to date.

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### 254 2:05 pm

Plasmon-promoted CO<sub>2</sub> reduction in amine-CO<sub>2</sub> adducts

**Christopher Turchiano, Doctoral/Chemistry (D)**

Mankind emits over 37 billion tons of CO<sub>2</sub> per year into the atmosphere where it is expected to remain for upwards of 400 years. While many efforts are directed towards reducing the amount of CO<sub>2</sub> we emit, fewer strategies exist to make use of the CO<sub>2</sub> rather than simply allowing it to slowly assimilate into the biosphere. CO<sub>2</sub> can be electrochemically reduced to value-added products under various conditions. In particular, recent investigations have demonstrated that amine-based solvents capture gaseous CO<sub>2</sub> and "transport" it to an electrochemical interface for more efficient reduction. The reduction reaction products can then be liberated by applying heat to the solution. We hypothesize that a plasmonic substrate can further improve the efficiency of the CO<sub>2</sub> reduction reaction through plasmonic photothermal heating, wherein heating occurs only at the reaction interface. The ability to localize and restrict heating is desirable as it may reduce or eliminate the need to heat bulk quantities of solution, thus lowering energy demands and improving the reaction efficiency.

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### 255 2:25 pm

TDDFT study of the absorption spectra of tricyclic cytosine derivatives

**Harrison Pearce, Joint Doctoral Program/Chemistry (D)**

Fluorescent probes are molecules that change their photophysical properties (brightness, absorption wavelength, etc) in response to their surroundings. They are valuable in biochemistry research, where they can reveal single nucleotide polymorphisms and show the interaction of DNA with DNA and proteins in real time. The family of tricyclic cytosine (8

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substituted 1,3-diaza-2-oxo-phenothiazine (R-tC) and 8 substituted 1,3-diaza-2-oxo-phenoxazine (R-tCo) compounds is of particular interest, because their brightness can increase or decrease in response to base pairing with guanine and as individual monomers, depending on the presence of an electron donating or electron withdrawing group attached. DEA-tC displays up to a 20-fold fluorescence turn-on response in response to base pairing, giving it the potential to be extremely useful in in-vivo and in-vitro studies. tC and tCo can both be incorporated into cells, and tC, despite being cytotoxic over a longer period of time, has successfully been incorporated in metabolic labeling to great effect, allowing for the study of RNA metabolism and location. Both DEA-tC and tC can be incorporated into DNA with reverse transcriptase. Unfortunately, DEA-tC is more cytotoxic than tC, and despite its increase in brightness upon base pairing, DEA-tC isn't very bright as a monomer.

The goal of this study is to provide a first step in understanding how to model the fluorescence turn-on effect of DEA-tC, so that brighter and less cytotoxic analogues of it can be developed. As a first step to understanding the behavior of the R-tC(o) compounds, we perform in silico calculations of the UV-visible spectra using time-dependent density functional theory (TD-DFT) in mixed explicit and implicit solvents. These solvents are water and 1,4-dioxane. Density functionals used include B3LYP, PBE0, and wB97XD and they are compared across a variety of basis sets. We create a protocol for the placement of water molecules in the calculation of the UV-Visible spectrum of the R-tC(o) compounds for reasonable accuracy. In the future, the emission spectra will be calculated with the same protocol.

## 256 2:45 pm

**Spectropolarimetry of Type Ia Supernovae: An investigation of the Si II 6355 Feature in SN 2018gv**  
**Julianna but I only go by JT Markham-Adkison, Masters of Science in Astronomy (G)**

Type Ia Supernovae (SNe Ia) represent the explosions of very small and dense stars known as white dwarfs, but the details of how the star explodes remains the subject of considerable debate. The various origin models and methods of ignition result in different shaped ejecta and/or distributions of material. By observing the polarization of SNe we can gather insight into the geometry of these explosions. A key diagnostic that appears to be correlated with other SN Ia properties is the change in polarization observed across the most prominent spectral feature, the Si II 6355 Å absorption feature. To investigate this, we are undertaking a systematic analysis of this feature in a uniformly obtained sample of SNe Ia observed at multiple epochs as part of the Supernova Spectropolarimetry (SNSPOL) Project [1] which gathered data from 2010-2018, using the CCD Imaging/Spectropolarimeter (SPOL) on the 61" Kuiper, 6.5 m MMT, and 90" Bok telescopes. Here we present a preliminary analysis of the Si II feature in a particularly well-observed object from our sample, SN 2018gv, and present 10 epochs of data spanning from 10 days before, to 22 days after, peak light. We compare our SNSPOL data near maximum light with complementary data presented by Yang et al. [2].

This work was supported by NSF grants AST-1210311 and AST-2010001, and NASA grant NNX15AU81G. References: [1] Hoffman, J. L., et al. 2017, in IAU Symp., 329, The Lives and Death-Throes of Massive Stars, ed. J. J. Eldridge et al. (Cambridge: Cambridge Univ. Press), 54. [2] Yang et al. 2020, ApJ, 902.

## Session C-9

Oral Engineering and Computer Science

Friday, March 1, 2024 1:00 pm

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### 257 1:05 pm

**Ultrasonic Guided Waves Scattering Spectra by Hybrid Global-Local Modeling for NDE in Composites with Varying Defect Features**

**MINGYUE ZHANG, PhD/JDP of Structural Engineering (G)**

Efficient non-destructive evaluation of composite structures can be achieved by accurately and rapidly characterizing and monitoring defects using ultrasonic guided waves (UGWs). However, the intricate interaction between UGWs and complex structures poses a significant challenge. This study employs a hybrid numerical method (i.e. Global-local) to investigate the influence of various defect types on ultrasonic guided wave scattering in composite plates.

Through analyses over a broad frequency range, the energy spectra of transmitted and reflected waves in defected composite plates are explored. Parametric analyses of defect type, dimensions and locations reveal trends in the influence of specific defect features on scattering behavior. The research emphasizes the importance of analyzing the scattering spectra across a wide frequency spectrum for a correct implementation and interpretation of inspections.

Utilizing the hybrid Global-Local method, the findings underscore the potential for effective defect characterization and monitoring. The insights obtained from parametric analyses offer a precise understanding of how defect dimensions and locations affect scattering behavior. This research contributes to the field by providing an efficient computational framework for analyzing ultrasonic guided wave interactions with defects in composite structures, advancing the potential for rigorous quantitative NDE and defect identification.

### 258 1:25 pm

**Atomization Feature Identification Tracking and Analysis**

**Evan Pruitt, Masters of Science Aerospace Engineering (G)**

Atomization is the breakup of a material into small pieces. This process is important in the application of chemical reactors, agricultural sprays, medical nasal sprays, and rocket engine injectors. Visualizing and quantitatively analyzing the performance of atomizers is challenging because of the small scale, rapid nature, and complex interplay of multi-phase flow

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dynamics. Using state-of-the-art high speed imaging and our novel image analysis software (AFITA) we bring the ability to identify, track, and analyze the atomization process. This technology can be used in the development of more effective atomizers in the chemical, agricultural, medical, and aerospace industries.

## 259 1:45 pm

### Evaluation Of Unmanned Aerial Systems (UAS)-Related Drivers' Distraction Using Eye Tracker Data And EEG Signals

**Zainab Afzali Kusha, Masters in Computational Science (G)**

Distracted driving poses a significant threat to traffic safety improvement, diverting drivers' attention and compromising vehicle control. While previous research has focused on the impact of distractions on driving performance, little is known about how brain activity is affected in these situations. This study aims to compare driver distractions caused by Unmanned Aerial Systems (UAS) and those stemming from existing work zone-based road closures utilizing Under Bridge Inspection Trucks (UBIT).

By leveraging Electroencephalography (EEG) and eye tracker signals, the research seeks to identify instances of heightened distraction and determine the safest technology for construction activities on roadways. Building on prior work that utilized an eye tracker to measure driver distraction in the presence of UAS, this project employs EEG and eye tracker signals to analyze driver distraction during UAS-induced visual disturbances.

With the participation of 100 healthy volunteers across different scenarios and conditions, this study will measure and analyze drivers' EEG responses and eye tracker signals to provide comprehensive insights into the nature of driver distractions. This research seeks to understand the situations in which drivers experience increased distraction and determine the most suitable and safest technology for engineering and construction purposes on roadways.

## 260 2:05 pm

### Material Hybridization for Tunable Performance of 3D Printed Lattice Structures

**Brandon Huffman, Masters of Science in Mechanical Engineering (G)**

Continuous introduction of photocurable resins for vat-photopolymerization (i.e., 3D printing) technology paired with the accessibility of reinforcing particulates unlocks the potential for new and improved composite materials. Integrating particulates with the polymer matrix hinders proper fabrication since their presence alters the interaction between light and resin, affecting the quality of the resulting prints. This project aims to reveal the process-structure-property relationship of compliant photocurable resins and glass microballoons to achieve tunable structural behavior of triply periodic minimal surface (TPMS) structures. Tensile and compressive samples with various ratios of reinforcing particles are printed and characterized to

assess the mechanical properties of the newly synthesized hybrid resins. Digital image correlation (DIC) is integrated into mechanical testing to ascertain the uniformity of the full field strain state, irrespective of local inhomogeneities due to the introduction of the reinforcing particles. Three TPMS structures (Schwarz Diamond, Schwarz Primitive, and Gyroid) are generated using open source software and are subsequently 3D printed using the newly synthesized and characterized materials. Each TPMS structure was prudently chosen based on its unique mechanical attributes: energy absorption and strength. The 3D printed structures were characterized under multiple loading scenarios to investigate the effect of strain rate on the mechanical response. The findings of this research reveal the potential of 3D printable sports gear for impact mitigations in various bio-mechanical loading scenarios.

## 261 2:25 pm

### Mass Timber-Concrete Footing Connections with Ductility

**Ramin Sarange, PhD in Structural Engineering Sciences (JDP) (G)**

The introduction of Cross-Laminated Timber (CLT) as a building material in North American construction has brought forth a range of advantages, including sustainability, ease of construction, and impressive structural properties. CLT panels, composed of layers of lumber boards stacked crosswise and glued together, have shown resilience and minimal damage in seismic events. However, the seismic performance of CLT buildings heavily relies on the connections within the structure, playing a crucial role in achieving the required stiffness, strength, and ductility.

The seismic performance of connections in CLT structures involves two mechanisms for energy dissipation during earthquakes. Low-intensity earthquakes are addressed through frictional effects and structural viscous damping, while mid- and high-intensity earthquakes involve plasticization of mechanical connections. Traditionally, the focus has been on prescribing tension for hold-downs and shear for angle brackets. Yet, the interaction between shear and axial tensile forces in connections may significantly impact their capacity in terms of strength, stiffness, and ductility.

Hold-downs, a critical component in CLT structures, consist of screws/nails connecting them to CLT panels, a metal base plate, and anchors. The current design mechanism aims for failure in screws/nails, which have lower energy dissipation capacity than anchors. The main objective of the project is to develop ductility in hold-down connections within CLT shear wall systems. This involves considering anchor type and stretch length mechanisms to enhance post-yield behavior, rotation capacity, and ultimate strength.

However, challenges arise in anchor selection and stretch length, impacting post-yield behavior and ultimate strength. Each component of the connection has its own ductile capacity, and failure is influenced by the relative stiffness of each component. The study aims to develop "Capacity Based Design" principles to achieve the desired ductile anchor failure mode.

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

The next steps involve performing full-scale tests of CLT wall-footing systems to observe and investigate the real behavior of hold-down connections. Additionally, a numerical model will be developed to capture the performance of hold-down connections with a ductile mechanism, using experimental data for validation. This comprehensive approach aims to advance the understanding and application of CLT in seismic-prone regions, contributing to the overall resilience and safety of timber structures.

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**262 2:45 pm****Mechanical Properties of Additively Manufactured Fiber-Reinforced Composites****Anil Singh, MSME (G)**

Additive manufacturing (3D printing) with multi-degree-of-freedom robotic platforms enables the realization of fiber-reinforced composites with unparalleled design flexibility, facilitating engineered layup schedules. The need for application-ready, 3D printed components requires extensive characterization to reveal the process-property interrelationships as a function of fabrication parameters. Therefore, the objective of this research is to explore the process-property interrelationships of additively manufactured, continuous fiber-reinforced polymer matrix composites. The approach hinges on using a novel, advanced robotic printing system with a large printing envelope as a function of a broad range of processing parameters. The efficacy of the fabrication process is evaluated by quantifying the discrepancies between the desired geometry and the realized part, including manufacturing defects and geometrical intolerances. The flexural properties of the material are assessed in terms of stiffness, strength, and failure mechanisms. The latter is supplemented by micrograph analyses using optical and electron microscopy. Finally, digital image correlation (DIC) is used to resolve the full field of the kinematic variables throughout the tested samples. The outcomes of this research help define the design envelope of this novel class of material.



# Abstracts of Presentations

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## Session D

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session D-1

Oral Behavioral and Social Sciences

Friday, March 1, 2024 3:00 pm

Legacy Suite

### 263 3:05 pm

THE AFTERMATH OF 'SCOUT ME IN' - What Happened After the Inclusion of Girls in the Boy Scouts of America (BSA)? - An Ethnographic Case Study of Organizational Change

**Matalino Lorenzo, Bachelor of Arts in Psychology (U)**

Scout used to mean the one on watch for the rest. Now it is a term ubiquitous with the World Scouting Movement, more specifically with Boy and Girl Scouts in America. As a Scout myself, I have watched members of the Boy Scouts of America (BSA) struggle to maintain their values of brotherhood and acceptance in the face of wider societal and organizational change. This includes the organization's 2019 acceptance of female individuals into its core programs. The purpose of this project is to examine the current state of affairs in a post-opening BSA. Through the use of interviews and auto-ethnographic methods, I uncovered narratives of resistance, struggle, and resilience from current members of the BSA. Analysis suggests that perceptions of organizational support and listening, as well as pro-active leadership from change-agents, are key to effective organizational change initiatives.

### 264 3:25 pm

Robert Schumann: Mental Health and Musical Creations

**Hannah Freed, Bachelor of Arts in Music and Bachelor of Arts in Psychology (U)**

The connection between mental health perspectives, musical creations, and musicology are inextricably intertwined, exemplified in the study of Robert Schumann whose struggles with mental health are well documented. Although the exact nature of Schumann's mental health diagnosis is unknown, there are many later diagnoses for conditions of which he may have been displaying symptoms. Due to ethical concerns diagnosing Schumann with a particular illness, this study only views Schumann's creative output through a lens of a contemporary mental diagnosis, schizophrenia. By viewing specific characteristics in Schumann's compositions and music criticism as manifestations of mental health symptoms, numerous resemblances to schizophrenia can be seen in his creative output. Schumann scholars have approached his musical output from numerous perspectives. James Deaville illustrates the contested term "madness" is directly correlated towards musicians, and in Schumann's time, the social stigma associated with medical conditions—especially mental health conditions—impacted the reception of a composer's work. Robert Bota and Jessica Galant-Swofford explain how musical hallucinations are related to numerous health complications.

While many view Schumann's musical stylistic choices—such as fragmentation and irregular rhythms—as madness, Yiyi Chen illustrates these aspects were purposeful musical qualities integrated from German Romantic aesthetics. In Schumann's composition *Märchenbilder* Op. 113, known as the "Fairy Tale Songs," numerous characteristics, including energetic rhythms and dynamic contrasts, stand out as reflections of Schumann's private mental space. In addition to his compositions, Schumann's writing—published and in personal journals—exhibits fragmentation and hallucination symptoms. Cross-analyzing research relating to Robert Schumann's creative musical experiences allows for the opportunity to better understand the relationship between mental health perspectives and musical creative output. Instead of diagnosing historical figures such as Robert Schumann, this research opens the discussion for the development of music therapy research, practices, and treatment for mental health disorders.

### 265 3:45 pm

Reinterpreting Narratives about Black Power: Racism, Resistance, and Survival

**Hungerford Tiffany, Africana Studies, B.A. in Liberal Arts and Sciences (U)**

Driven by the quest for justice, equality, and empowerment, Black Power organizations emerged during pivotal periods in history. Yet, Black Power advocates are oftentimes labeled as radical, militant, and sexist, affecting popular opinion and generating fear in the proletariat. These narratives fail to capture their goals, experiences, and historical contributions. By focusing on Black Power through a lens of survival under systemic oppression and racial capitalism and by delving into their ideologies, which often encompassed self-determination, community empowerment, and cultural affirmation, this paper will challenge these common narratives about Black Power organizations. Specifically, it seeks to examine and dispel common misconceptions surrounding the Nation of Islam (NOI) and the Black Panther Party (BPP), two key Black Power organizations of the twentieth century, acknowledging how media and historical narratives sensationalized their confrontational aspects while neglecting the broader socio-political context. The paper will explore their rejection of racial subjugation and economic exploitation and shed light on their strategies of challenging systemic oppression by considering their use of direct action, community organizing, and advocacy as crucial tools of resistance. This paper is also attentive to the complexities and controversies surrounding the NOI and BPP, acknowledging both internal and external challenges they faced that limited the building of power. It also discloses that Black Power organizations are not monolithic entities, emphasizing the diversity of approaches and perspectives and examining how these organizations evolved over time in response to changing social and political landscapes. By unraveling misinterpretations about the NOI and BPP, this paper contributes to a nuanced understanding of racial and economic justice movements in contemporary society.

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## 266 4:05 pm

### The Phenomenon of Deviance

**Eric Curiel, Criminal Justice (U)**

Why and how does the process of criminality occur? What demographic in America is most susceptible to this stigma? Is there a single cause contributing to illegal activity? Will there ever be a panacea to this primitive social pandemic? All of these inquiries pre-date challenges humanity has strived to resolve since the foundation of ethics in society. In this work study, we will explore the diversity in backgrounds present in the American Justice System concerning the paths of crime pursued. Over the progression of years, various theorists, sociologists, philosophers, and scientists have each contributed to developing theories that elucidate the underlying cause of illicit behavior among individuals in the community. Meanwhile, mainstream media sullenly presents these theories when political initiatives advocate a distinctive approach to legal sanctioning. Thus, American society remains virtually incognizant of the theories encompassing deviant behavior. Subsequently, disputes concerning the ideal method to react to criminal offenses continue to characterize a static ambivalence in America's discussions today. Embodying this research is the manifestation of the significance of criminal theories in real practice to the experience of individuals in the Criminal Justice System. Specifically, perceptions of the essential figures comprising our justice system will be interviewed to ascertain relativity to any criminological theories postulated by prominent schools of criminology. Ultimately, the discovery of the most correlation to the theories of criminology will maintain the primary motive for this experiment.

## 267 4:25 pm

### Does Fair Exist? - A Case Study on Ethics, Decision-Making, and Leadership in the 9/11 Victim Compensation Fund as Shown in the Film "Worth"

**Savannah Nix, Communication (U)**

This presentation delves into the impacts of ethical leadership and the decision-making processes of organizations during crises, using the 9/11 Victim Compensation Fund (VCF) as a case study. Established post-9/11, the VCF aimed to financially compensate victims and their families, with Kenneth Feinberg, the special master of the Fund, determining the monetary value assigned to each life affected. The analysis focuses on the Fund's success, attributing it to elements such as rationality, bureaucracy, decision-making, stakeholder interests, and ethical leadership amid moral ambiguity. By examining organizational communication aspects, including Herbert Simon's concept of "satisficing," the case study reveals a harmonious integration of rationalism with emotional considerations. The Fund's achievements are further linked to empathetic, transparent, and candid communication with the public and stakeholders. Notably, the transformation of the Fund's leader from a transactional to a more transformational style played a pivotal role in its success. The research emphasizes that the Fund's effectiveness is intrinsically tied to ethical considerations embedded in its leadership and

decision-making processes. This case study highlights the importance of ethicality in navigating complex situations, emphasizing the need for leaders to embrace a transformational approach, integrate rational and emotional elements, and communicate openly with stakeholders. The success of the 9/11 VCF serves as a compelling illustration of how ethical leadership can positively influence decision-making in times of crisis, ultimately fostering organizational resilience and success.

## 268 4:45 pm

### The Effect of Ethnic Discernment on Exogamy in the US

**Audrey Lacher, Mathematical Economics (U)**

What factors influence the decision by immigrants to marry within or outside of their ethnic group? I attempt to answer this question by using data from the 2008-2016 American Community Survey. This datasource allows for improved estimation of the determinants of endogamy as it includes information on the year in which an immigrant married. I am thus able to restrict my sample to individuals who migrated to the US as adults, but did not get married until after they arrived. This is a significant improvement over the existing literature, which primarily looks at migrants who arrived in the US before they were of marriage age. Given childhood formation of preferences, the determinants of intermarriage are likely to differ between these two groups. I find strong evidence of assortative matching in education for immigrants. Educated immigrants are more likely to intermarry when they come from relatively less educated communities, while intermarriage rates fall for education migrants coming from relatively better educated communities. In addition, culture appears to play a large role, with East and South Asian migrants being the least likely groups to intermarry, even after controlling for observable characteristics like education and exposure to natives. This could be attributed to major shifts in the racial composition of immigrants post-1965. By constructing a series of unique ethnic identities derived from census data, exogamy can be redefined to better predict marriage market behavior across migrant and native populations.

## Session D-2

Oral Behavioral and Social Sciences 1

Friday, March 1, 2024 3:00 pm

Love Library 430

## 269 3:05 pm

### Cognitive Approaches to Literature

**Jorge Arana, MA in English (G)**

Emerging research in the nascent field of neuroscience has provided frameworks with which to study reader's physiological response to text and aesthetics in literature. The advent of this research has provided a scholarly space in which researchers of the humanities may engage in cognitive approaches to literature. This literary review focuses on collecting the historical

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body of interdisciplinary scholarly research that studies readers' neural response to literature, from Shakespeare and Harold Bloom to reader-response theory and modern fMRI scans of brain activity during reading. Further, the review covers scholarly work that studies consciousness in the novel and places it in the context of existing neuroscience to begin developing a theoretical framework with which to study the relationship between aesthetics in literature and brain science. This literary review elucidates the neural processes of creating and experiencing literature and proposes that cognitive approaches to literature and research into text neuro-aesthetics are indispensable to future literature study, as they explore the subtleties that interconnect readers to reading, and advance the research on the mysteries of human development as it relates to the advent of writing and narrative.

### 270 3:25 pm

#### The Impact of Adverse Childhood Experiences on the Experience of Living with Endometriosis

**Shea O'Donnell, Master of Arts in Psychology (G)**

Endometriosis affects an estimated one in ten people assigned female at birth (AFABs) worldwide (WHO, 2021), yet it remains understudied. In this study, I examine the impact of adverse childhood experiences (ACEs) on the experience of living with endometriosis.

Endometriosis is a chronic disease characterized by tissue similar to the lining of the uterus growing outside the uterus. Symptoms can include severe pelvic pain, pain with intercourse and bowel movements/urination, nausea, fatigue, and infertility, which can have a profound effect on quality of life (Gao et al., 2006). There is limited research on how ACEs affect the experience of endometriosis. Studies, however, suggest there is a link between trauma, the development of endometriosis, and associated symptoms. One longitudinal study (1989-2013) found that out of 60,595 premenopausal women, 3,394 (5.6%) had endometriosis (Harris et al., 2018). Importantly, there was a 79% increased risk of endometriosis for women reporting severe chronic abuse of multiple types. Furthermore, the correlation between abuse and endometriosis was stronger among women without infertility, who are more likely to experience endometriosis pain.

For the present study, 150 AFABs ages 20-50 years old (M = 31.93, SD: 6.75) who had been surgically diagnosed with endometriosis completed a Qualtrics survey. Participants' adverse childhood experiences were measured using the 10-item ACEs Questionnaire (Felitti et al., 1998). The impact of endometriosis on participants' lives was measured using the Endometriosis Impact Questionnaire (EIQ; Moradi et al., 2019), which consists of six subscales (physical, psychological, social, educational, work, and substance abuse), as well as a Likert-scale item measuring treatment satisfaction.

Bivariate correlations revealed that eight of the ten ACE items and their overall sum were positively correlated with EIQ subscale scores (at least one ACE was correlated with each subscale) and negatively correlated with treatment satisfaction (all  $p$ 's < .042). This suggests that the more adverse childhood experiences, the greater the impact of endometriosis on

patients' lives and on their treatment experience. These results may help practitioners better understand and treat this population.

### 271 3:45 pm

#### Advantages of early linguistic exposure: variation in the perception of Spanish diphthongs by L2 and heritage learners of Spanish

**Carolina Vargas, Masters of Arts in Spanish (G)**

The current study examines the effect of established native perceptual categories of English on the perception of Spanish [ei] diphthong sequences by Spanish learners as a second language (L2) and as a heritage language (HL) (speakers whose first language (the HL) was learned primarily through natural input at home as a minority language (Montrul, 2008)), under the revised Speech Learning Model (Flege & Bohn, 2021) and the Perceptual Assimilation Model (Best & Tyler, 2007). We explore whether perception is affected by cross-linguistic influence and exposure to the target language, hypothesizing that L2 learners may struggle in perceptually contrasting the diphthong [ei] and the monophthong [e] in Spanish, since both sounds tend to be assimilated to the same English category /e/. Whereas for HLs, this contrast may be less difficult since they have been exposed to these Spanish sounds from an early age. To corroborate this hypothesis, a language background questionnaire was designed to determine participants' previous experiences with Spanish and two perception tasks that focused on the identification and discrimination of these sounds. The participant groups considered for this study were college-level Spanish students (L2 & HL), and a comparable group of monolingual Spanish native speakers (NS) from Mexico and Colombia. Analyses reveal that the L2 learners were less accurate than the native speakers in identifying and discriminating the Spanish diphthong [ei], especially when the diphthong appeared word-finally. In contrast, the heritage learners achieved higher accuracy rates on both perceptual tasks, likely due to an earlier exposure to the Spanish language since childhood (Best & Tyler, 2007; Chang, 2021; Flege & Bohn, 2021).

### 272 4:05 pm

#### Title "Bupe by the Book": An exploration of mental health and social support among unhoused individuals using opioids around San Diego public libraries

**Mayra Lam Yuen, Masters of Social Work (G)**

##### Background

Opioid overdoses in the U.S. have increased significantly. Approximately 10,000 people in California died from drug overdoses in 2021. Substance use and homelessness have been associated with negative physical and mental health. This study is embedded in the parent grant, "Bupe by the Book" (BBB) (R21DA056805), which applies telehealth-buprenorphine interventions within public libraries for unhoused individuals with opioid use disorder. We compare participant mental health

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

and social support at baseline and 1-3 months follow-ups.

#### Methods

The authors conducted street outreach to recruit participants around two San Diego Public Libraries and referred them to Father Joe's Village Health Center. Quantitative and qualitative baseline and follow up Qualtrics surveys (n=210) were conducted with participants July 2023-March 2024. Flyers were placed within libraries. Data were analyzed using the Brief Assessment of Recovery Capital scale ("How often is each of the following kinds of support available to you if you need it?" from "1-None of the Time to 5- All of the Time"). The PHQ-9 Depression scale assessed: "Over the last two weeks, how often have you been bothered by feeling down, depressed, or hopeless? (Not at all to nearly everyday)".

#### Results

Our study population (n=92) were 72% males and 46% identified as White followed by Latino/a/x (27%), Black or African American (13%) American Indian/Alaskan Native (6%), Asian/Pacific Islander (4%), and Other (2%). At baseline, depression (21%) and anxiety (20%) were the highest self-reported diagnoses, followed by PTSD (15%), ADHD/ADD (15%), bipolar disorder (10%), other mental health issue not listed (8%), OCD (7%), and schizophrenia (3%). At baseline, 52% of participants felt over the last two weeks they had been bothered by feeling down, depressed, or hopeless "nearly every day." At baseline, 30% disagreed with the statement "In general I am happy with my life." Qualitative data are explored for themes related to participating in the study over time.

#### Conclusion

Mental health and substance use disorder among unhoused individuals is a public health crisis. Sustainable, low-barrier substance use and mental health resources are urgently needed. Our findings suggest that public libraries are an innovative way to reach this most vulnerable population.

### 273 4:25 pm

#### Sexual Assault Prevention: How California Institutions of Higher Education Currently Respond Compared to Previous Review

**Samara Camarillo, Masters of Criminal Justice & Criminology (G)**

Sexual victimization is a pervasive issue among institutions of higher education. However, it has been over five years since the last systematic review of institutions' approaches to sexual assault prevention (Richards, 2019). Since then, several events have impacted how institutions respond, including the #MeToo Movement and the COVID-19 pandemic. To address this gap in the literature, we conceptually replicated Richard's (2019) methodology in a comprehensive review of all California four-year public and private-nonprofit higher education institutions that received Title IV funding. Specifically, we investigated the Clery Act and Title IX compliance for each institution's website, annual security reports, and student-orientated resources. Comparing our review and Richard's (2019) review shows that public and private-nonprofit

institutions increased their compliance with amnesty policies. By contrast, private-nonprofit institutions reduced the availability of on-campus counseling. In addition, public and private-nonprofit institutions reduced the availability of survivor advocates and public procedures for victims to follow if a sexual assault occurs. These findings suggest that while overall compliance with Title IX policies has improved since 2019, resource availability for victims has declined. We discuss the potential roles of campus closures in creating these changes and make recommendations for bridging policy gaps within the California State University system.

### 274 4:45 pm

#### The Impact of Parental Stress on Child Internalizing and Externalizing Behaviors by Gender

**Avery Cardosi, Master of Arts in Sociology (G)**

Prior research has effectively illustrated the detrimental effects parental stress and aggravation have on children's behavioral outcomes. Exposure to parental stress is associated with negative internalizing and externalizing behaviors in children (Jones et al. 2021; Suh and Luther 2020; Taraban and Shaw 2018; Crum and Moreland 2017), which in turn adversely impacts their life and development through lower test scores, poor academic performance (Kulkarni and Sullivan 2022), and increased juvenile delinquency (Anjaswarni et al. 2019). However, further research is needed in order to understand whether the association between parental stress and children's externalizing and internalizing behaviors varies by child gender, and whether these relationships are mediated by parenting practices. In this study, I will conduct Ordinary Least Regression modeling (N=2,191) using data from the Future of Families and Child Wellbeing Study (FFCWS) (McLanahan et al. 2019) to examine how parental stress impacts internalizing and externalizing behaviors in late childhood, whether this relationship varies by gender, and whether parenting practices mediate this relationship. The goals of this study are to bridge the gap in literature regarding gender roles in children's behavioral outcomes and to aid in the creation of more targeted and holistic parenting interventions. Preliminary results are consistent with the prior literature, and indicate that the variable of gender is statistically significant to child displays of externalizing behaviors as a result of parental stress, but not significant to displays of internalizing behaviors.

## Session D-3

Oral Behavioral and Social Sciences 2

Friday, March 1, 2024 3:00 pm

Love Library 431

### 275 3:05 pm

A Culture-Centered Approach to Meanings of Health and Understandings of Environmental Risks Associated with Brownfields Exposure in National City

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

### **Brianna Pham, Master of Arts in Communication Studies (G)**

This ongoing qualitative research, following Dutta's (2008) culture-centered approach (CCA), delves into the health perceptions and environmental health injustice among National City, California residents. While historically marginalized and exposed to environmental hazards due to industrial activity, highway proximity, and incompatible land uses, certain areas in National City are designated as environmentally contaminated, including brownfields—properties complicated by hazardous substances (EPA, 2023).

As part of a health communication needs assessment within the broader SAGE project, this initiative led by graduate students explores residents' health conceptualizations and perceptions of environmental risks. Its goal is to develop community-centric content raising awareness about brownfield risks and engaging with the SAGE Brownfields Project resources, an EPA-funded federal project.

Recruiting participants through in-person, convenience, and snowball sampling, the team conducted 25 interviews in English and Spanish. Using a semi-structured protocol aligned with CCA, the analysis reveals residents' limited agency in addressing environmental challenges. In this low-resource community with minority populations, health can be deemed secondary to the demands of work and sustenance. National City residents lack the resources to be socially aware of brownfield risks, emphasizing the need for community engagement, public service announcements, and a communication platform empowering residents to contribute to social change.

Dutta, M. J. (2008). *Communicating health: A culture-centered approach* (1st ed.). Polity.

(2023). *Understanding brownfields*. United States Environmental Protection Agency. <https://www.epa.gov/brownfields/understanding-brownfields>.

### **276 3:25 pm**

**¿QUÉ ES LA PERTENENCIA?: social constructions of belonging among latinx tutors at a hispanic-serving institution**

**Rebeca Navarrete, Masters of Communication (G)**

A sense of belonging, or sentido de pertenencia, is an important and necessary

communication process for Latinx and Hispanic-identifying students that attend designated

Hispanic-Serving Institutions (HSI's). This study focuses on amplifying the voices of

undergraduate Latinx and Hispanic-identifying Pathways Service-Learning tutors that

currently attend or recently graduated (in Spring 2023) from San Diego State University, a

federally designated Hispanic-Serving Institution (HSI) since 2012. Cultivating a sense of

belonging among students is key to the retention of Hispanic-identifying and Latinx students. This study aims to contribute

to organizational communication research in theorizing belonging as a reciprocal process of identification with the organization and its members. Therefore, this study takes a critical-ethnographic case study approach with the Pathways Service-Learning Tutoring Program to This study analyzes fieldnotes from 6 class sessions, 1 workshop, and 2 events along with 329 pages of in-depth interview transcripts from 15 participants— 8 San Diego State students who are in the Pathways program, and 7 Pathways administrators. To guide the analysis, this study follows the phronetic-iterative approach that relies on sensitizing theoretical frameworks such as the four flows model, the cultural wealth model and my own immersion in the Pathways program. This study is designed to answer the following two research questions in a manner that centers and amplifies Latinx voices: (1) How do Latinx or Hispanic-identifying tutors in the Pathways Service-Learning Tutoring Program construct belonging? And (2) What organizational practices at Pathways construct or disrupt discourses of belonging and otherness? The analysis of this study supports the Pathways program to continue to make organizational practices and policies that support their diverse population of over 100 tutors per academic year post COVID-2019 and contributes to supporting Hispanic-Serving Institutions in understanding what constructs inclusive organizational cultures that best support the personal, academic, and professional growth of Latinx students.

### **277 3:45 pm**

**Analyzing the association between starting cancer treatment and the COVID-19 lockdown protocols**  
**Enrick Kyle Fontelera, Master of Public Health in Epidemiology (G)**

Background

Cancer is the second leading cause of death in the United States. Receiving cancer treatment can help an individual's situation, by curing it altogether or at the very least, prolonging their lifespan. However, the COVID-19 pandemic introduced a new barrier to accessing cancer treatment through variable protocols like stay-at-home orders and lockdowns.

Method

This study examines the association between receiving cancer treatment and the covid lockdown protocols in the United States among males and females between 2018 and 2022. Any responses recorded before March 15, 2020, were considered "pre-covid" and any other dates were considered "post-covid". We used a chi-square analysis to assess any unadjusted bivariate associations and a multivariable analysis to adjust for factors identified through a backward stepwise regression.

Results

We started with n=2,591,503 and after excluding those who did not indicate male or female, not have cancer, and did not indicate they were seeking or receiving cancer treatment, the final study population was 7,944. Among the study population, 69% (n=6,311) are already receiving cancer care and 77% of responses (n = 6,685) were taken after the March 15 cutoff point. Overall, the odds of receiving cancer care post-covid

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is 1.203 times the odds pre-covid. Among those who live in a moderately stringent state, the association is significant with the odds of receiving cancer care post-covid is 2.12 times the odds pre-covid.

Discussion

This study can inform public health professionals of the effects of a pandemic and protocols on access to care. It is possible that people may have become more aware of the importance of health after the pandemic, that they start seeking and receiving care. Relative to other diseases, COVID-19 is still new and the long-term direct and indirect impact on the population still must be studied, especially among vulnerable populations and those who were already struggling with seeking treatment care.

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### 278 4:05 pm

Mexican Labor in a Changing Landscape: The Mexicali, Baja California Labor Movement in the 1990s

**Cassandra Garcia, Master of Public Administration/Master of Arts in Latin American Studies (G)**

Mexico has a storied relationship between labor and the state, and understanding its beginnings is crucial to understanding the current situation. The political relevance of the labor sector was institutionalized in the 1917 Mexican Constitution, which enshrined labor rights under Article 123, establishing labor groups as key players in the political landscape. During the 71-year dominant party "classic" Mexican political system, the ruling PRI (Institutional Revolutionary Party) embedded labor-state relations into a corporatist party-state system. Party leaders initially presented corporatist labor organizations as vehicles of political representation, but over time they evolved into mechanisms for social control. In this paper, I analyze the ways in which the corporatist model of state-labor relations developed in the northern region of Baja California. I focus on the 1990s, the last decade of PRI dominance, as party leaders embraced free market liberalism. The Mexican neoliberal project accelerated with full force, undermining the premise and the institutions of the classic corporatist system. My research examines the relationship between labor union strength and neoliberal public policies in Mexico by analyzing how neoliberal restructuring influenced state-labor dynamics and impacted the working class in the 1990s. More specifically, I examine how the classic dynamic of state-labor relations was manifest in the Mexicali, Baja California region of the U.S.-Mexico border, in order to understand the evolution of state corporatism as the northern border region moved towards an export-led industrial growth model. Another crucial research question centers on the responses of the working classes to an environment which prioritized capitalist investment and principles of market liberalism over the rights of the workers articulated in the constitution. Analyzing the relationship between the growth of the maquiladora sector and consequent actions by organized labor will explain the changing labor dynamics during the crucial period of the 1990s.

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### 279 4:25 pm

Machine learning detection of anthropogenic debris in complex floodplain environment

**Peaceibisia Jack, Masters of Science in Geography (G)**

Plastic waste is a growing environmental concern, particularly in coastal cities where mismanaged solid waste can have significant impacts on the ecosystems by contaminating these ecosystems, thereby adversely affecting aquatic life and overall environmental health. This paper presents a study on the use of machine learning techniques and hyper-resolution aerial imagery for mapping and analysis of plastic debris in a San Diego floodplain. The study found that machine learning algorithms can accurately detect and classify plastic debris in aerial imagery, providing a cost-effective and efficient method for monitoring plastic waste in riverine environments. The results of the study also highlight the need for improved waste management practices and increased public awareness to reduce the amount of plastic waste entering coastal ecosystems. Overall, this study demonstrates the potential of machine learning and aerial imagery for managing plastic riverine debris and protecting coastal ecosystems from the harmful effects of plastic waste.

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### 280 4:45 pm

Concordance between self-reported hazardous alcohol use by the audit-c and phosphatidylethanol (PEth) among heavy drinking fisherfolk men living with HIV in Uganda

**Doreen Tuhebwe, Public Health (G)**

Introduction:

Researchers have highlighted discrepancies between the direct metabolite of alcohol consumption, Phosphatidylethanol (PEth), and other self-reported alcohol measures such as the Alcohol Use Disorder Identification Test-Consumption (AUDIT-C). Under- or over-reporting of alcohol use may affect screening results and service delivery for patients in need of care, such as persons living with HIV (PLWH). In Uganda, heavy alcohol use contributes to sub-optimal HIV treatment outcomes among fisherfolk disproportionately burdened by HIV. We assessed the concordance between PEth and AUDIT-C among fisherfolk men LWH, aged 18-50 years.

Methods:

We analyzed data from the baseline assessment of the Kisoboka trial collected among 160 fisherfolk receiving care at five HIV clinics in Wakiso District, Uganda (2021-2022). Fisherfolk men on antiretroviral treatment who self-reported hazardous alcohol use (AUDIT-C  $\geq$  4) during study screening were eligible. The AUDIT-C tool was interviewer-administered using locally adapted standard alcohol drink size pictures. From dry blood spots, PEth was tested using liquid chromatography-tandem mass spectrometry. We explored the distributions of AUDIT-C and PEth, conducted a correlation analysis using the Spearman's rank test based on the risk levels in the sample and assessed the positive and negative predictive values (PPV

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and NPV).

Results:

Mean PEth was 551.3ng/ml ( $\pm 601$ ), with a median of 299.7 (1.0-3664.6). In this sample, 94.4% (151/160) had a PEth of  $\geq 20$ ng/ml and 63.1% (101/160) had an AUDIT-C score of  $\geq 8$ —an indication of very hazardous alcohol use. Overall, PEth measurements were significantly correlated with AUDIT-C (Spearman  $r=0.42$ ,  $p<0.0001$ ), but with moderate correlations. AUDIT-C  $\geq 4$  ( $r=0.34$ ,  $p<0.0001$ ) and AUDIT-C  $\geq 8$  ( $r=0.35$ ,  $p=0.0004$ ) were significantly correlated with PEth. The PPV was 73.3% for fisherfolk who had PEth  $\geq 200$ ng/ml among those with AUDIT-C  $\geq 8$  while, NPV was 49.2% for fisherfolk that had a PEth  $<200$ ng/ml among those that had AUDIT-C $<8$ .

Conclusion:

AUDIT-C and PEth were correlated which may indicate that in heavily drinking populations, AUDIT-C has good agreement with PEth. This study used adapted standard alcohol drink visuals, and this may have enhanced accuracy of the AUDIT-C. Future studies should explore the PEth and AUDIT-C distributions that correlate best in this population for improved risk assessment.

## Session D-4

Oral Visual and Creative Arts

Friday, March 1, 2024 3:00 pm

Aztlan

### 281 3:05 pm

Yinka Shonibare's Use of African Wax Print Fabrics  
Question Cultural Identity

Gabrielle Berens, Masters of Fine Arts (G)

The use of African wax print fabrics (also known as Dutch wax) has become an increasingly popular visual device in global contemporary art. These fabrics are easily recognizable as a representation of African culture. On the surface, they display vibrant bright colors and multiple layers of patterns and symbols, but the complex history of this cultural commodity is deeply rooted in colonialism and reveals a common pattern of global trade routes, since they are actually manufactured in Holland and shipped to Africa for consumption. Cultural theorist Daniëlle Bruggeman sums up the complex history of these textiles writing, "Destined for export as the product of a former colony, the cloth is at once an ersatz, mass-produced interpretation of traditional Indonesian textiles, and a proud emblem of 'authentic' African dress."

My presentation explores the work of contemporary Nigerian-British artist Yinka Shonibare, who has centered his multidisciplinary practice and art career around the use of these African wax textiles. Using art historical methods of formal analysis, social art history, and postcolonial critique, I analyze two of Shonibare's sculptures which utilize these fabrics as an aesthetic component and as a conceptual framework: Nelson's Ship in a Bottle, and Woman Shooting Cherry Blossom. Nelson's Ship in a Bottle is a large public sculpture of a colonial British battleship featuring African wax print sails and is

enclosed in a glass bottle. Woman Shooting Cherry Blossom, is a sculpture of a female mannequin wearing a traditional western colonial dress fashioned out of African wax print fabrics. The mannequin's head is a globe and it is actively shooting a rifle that expels a cherry blossom tree. Shonibare claims to use the fabrics as a "metaphor for the contemporary African existence." By combining African wax print fabrics with fantastical colonial references, such as a ship in a bottle and aristocratic costuming, I argue that Shonibare is presenting the dualities of the contemporary African existence; one of vibrance and wonder but one that has been unjustly and forcibly influenced by colonialism and global trade.

### 282 3:25 pm

Visualizing Resistance: Decolonized Aesthetics and Subverting Dominant Narratives

Robin North, Masters of Fine Art (G)

My presentation, "Visualizing Resistance: Decolonized Aesthetics and Subverting Dominant Narratives," analyzes my photographic series titled Decolonized Aesthetics. This series engages the 19th-century process of platinum palladium printing to depict contemporary African Americans' re-examination of photography and its intersection with history and the ways the medium was used to perpetuate racist stereotypes. Decolonized Aesthetics addresses the history of African Americans' unpaid labor and the economic engine of cotton to reposition Black bodies as having agency and control over their own labor. It considers the roots and routes of the Atlantic slave trade and its creolization, the dynamic fusion of multiple cultures that emerged from the forced transoceanic migrations of the Black Atlantic. This fusion created new identities and artistic expressions that challenge dominant narratives. By reconstructing the narrative and positioning Black bodies as creolized people of agency, a synthesis of multiple cultures is created that gives the privilege of self-expression. My presentation analyzes my artworks through visual and critical interpretive methods rooted in decolonial and postcolonial studies and theories of racialization. I demonstrate how my research-based and conceptual visual arts practice challenges hegemonic narratives and structures about race and decolonizes knowledge through the theoretical lens of Paul Gilroy's concept of the "Black Atlantic." With a deep understanding of the importance of decolonizing practices, my art practice sheds light on the significance of critical reevaluation and reclamation of artistic narratives and the exploration of new perspectives and methodologies. I argue that my Decolonized Aesthetics series serves as a mechanism to reconceptualize and reinterpret the camera as the master's tool. I use the "master's tools" to represent theoretical, visual anthropological, and grounded theory methodologies that place me in the local cultures and provide a visual storytelling approach to educate and decolonize knowledge free of Western narratives and aesthetics to "dismantle the master's house" (Lorde, 106). Ultimately, I demonstrate how my series Decolonized Aesthetics marshals artistic expression to engage actively with history, power dynamics, and representation, and it has created a space for Black voices and perspectives to be heard and valued in the deep south of Texas.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

### 283 3:45 pm

#### Man She's Really Cookin': An Analysis of Gender Performativity in Women Instrumentalists During Jazz Improvisation

**Sarah Irvin, Masters of Music in Jazz Studies (G)**

The idea of gender equity has been an ongoing conversation within many fields. This topic has surfaced for discussion in music and more specifically in the jazz genre within the last few decades. Women jazz instrumentalists have often been overlooked and undocumented in historical accounts. An aspect within jazz that many women instrumentalists participate in is the act of improvisation, an act that is commonly thought of as a masculine practice. For my project I will be examining the role of gender in improvisation through women instrumentalists. Experts within the field comment on the many factors that contribute to improvisation being perceived as an inherently masculine act such as cultural upbringing and societal acceptance. For my project, the issue of gender in improvisation will be explored through biographies, feminist theory, interviews, and performance interpretation. For my examination I will draw upon Judith Butler's concept of gender performativity as it relates to improvisation. My research has opened my eyes to the differing views held by women in the jazz community when it comes to activism. My research has also provided some insight into why our society views improvisation as masculine act as opposed to a feminine act. Some possibilities for further research include looking into the current state of the jazz community's idea of gender and women's involvement with jazz in academic institutions.

### 284 4:05 pm

#### A Kingdom as Great: Navigating Girlhood in "Labyrinth"

**Daisy Scott, Master of Arts in English (G)**

Transporting viewers to a realm populated by director Jim Henson's whimsical puppets and ruled by David Bowie in the role of a provocative Goblin King, the 1986 film "Labyrinth" maintains its status as a cult classic. Part adventure, part bildungsroman, "Labyrinth" follows the 16 years-old Sarah (played by Jennifer Connelly) who must solve a magical labyrinth ruled by a Goblin King (David Bowie) in order to save her infant step-brother from becoming a goblin himself. Much of the film's creative edge emerges through the tension between its childlike wonder and darker realities that force Sarah to confront the social expectations that will soon be placed upon her as a young woman entering adulthood. In this presentation, I analyze Sarah's character in conversation with gothic and children's literature traditions, specifically her connection to "Alice in Wonderland" and "The Wizard of Oz" — both works that Henson cited as sources of inspiration. However, whereas both Alice and Dorothy are guided by strong women on their journeys, Sarah receives no such female support. Instead,

Sarah must survive a labyrinth dominated by male characters that range from chivalrous allies to those who are physically threatening and overtly sexualized. Her relative success is largely determined by which men she chooses to trust — that is, until she finally asserts her own power as a young woman and learns to reclaim rather than reject her "girlish" passion for fantasy. Ultimately, I argue for reading "Labyrinth" as a gothic representation of the struggles young women endure while learning how to navigate the lived maze of our historically patriarchal society. This contributes to critical conversations on how popular culture and media perpetuates ideas of how young women should emotionally mature, as well as how gothic aesthetics within children's literature are utilized to critique or undermine social norms.

### 285 4:25 pm

#### Roadside juveniles: Understanding how interfacing with humans affects juvenile moor macaque (*Macaca maura*) behavior

**Dania Abizaid-Herrera, Master of Arts in Anthropology (G)**

The juvenile life history stage represents a key learning point in the lives of all primates because how juveniles learn determines whether they will survive until adulthood. Regardless, juveniles have often been defined as inexperienced or clumsy, and juvenile behavior and what affects it remains poorly understood. Our research goal was to address this gap by examining juvenile moor macaque (*Macaca maura*) behavior in the context of rapid environmental change in South Sulawesi, Indonesia. From August to November 2023, our study took advantage of the dual habitat present in Bantimurung Bulusaraung National Park, comparing behavioral data collected on juvenile social and foraging behavior while in interior forest versus when along a heavy traffic roadside. Additionally, foraging events were categorized to determine juvenile preference for specific foraging strategies and social learning models in each context. Juveniles were followed for a total of 603 hours, equaling 683 instantaneous activity focal follows and 4,090 scan records. Results showed that more than 90% of the time juveniles spent foraging was done so independently. Nonetheless, the majority of model dependent foraging events were observed by the roadside, where juveniles rely more on social learning models to obtain provisions from humans. Additionally, social learning model preference was not limited to adult females as predicted, but instead changed depending on the model dependent foraging strategy selected. These findings enhance our understanding of how juvenile primates are responding and adapting their social learning strategies to the rapidly expanding human-primate interface at our field site. Additionally, studying juvenile behavior in these types of shared contexts can enable us to better predict how primate populations will behave in the future, aiding conservation and conflict management efforts.

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session D-5

Oral Education

Friday, March 1, 2024 3:00 pm

Metzli

### 286 3:05 pm

#### Parents' Roles and Involvement in an Urban Secondary School's Ambitious Mathematics Program

**Esperanza Ochoa, Doctorate of Philosophy - Education (D)**

In this paper, we analyzed parents' perceptions of their role in an ambitious mathematics program (AMP) at a high-need school. Using a framework by Civil et al. (2005), we found parents were primarily positioned as parents and to a lesser extent as learners. Through thematic analysis, we developed a framework that unpacked the specific roles through which parents embodied their broader roles as parents and learners from least to most direct involvement with an AMP. Common roles for parents as parents included checking their children's grades and homework and ensuring resources for their children's success. We linked these roles to the nature of the AMP's communication with parents, thus warranting the need for more research on parent involvement with AMPs.

### 287 3:25 pm

#### Enhancing Rural Students' College Pathways: Incorporating Academic Match and Student Fit Preferences as an Alternative to Undermatch Theory

**Catherine Longstreet, Joint Doctoral Program in Education (D)**

Rural students encounter distinct obstacles, and often have limited options for pursuing higher education. Unfortunately, existing research on college access often overlooks their experiences, further marginalizing this group. This study aimed to address this gap by delving into the college pathway selection process among rural students, specifically focusing on the concept of undermatching. Undermatching occurs when students opt for less selective colleges than those that align with their academic capabilities. The investigation not only assesses the limitations of undermatching theory, but also introduces a proposed college pathway intervention grounded in Opportunity to Learn (OTL) theory. This intervention emphasizes the critical influence of social context and cultural attitudes on rural students' decision-making processes. This research utilizes the nationally representative High School Longitudinal Study of 2009 (HSL:09) as its data source, allowing for an in-depth examination of rural students' college pathways, insights into their decision-making processes, and the factors shaping their choices. The multifaceted findings of this research reveal a noteworthy pattern among first-generation students, a substantial portion of the rural student population, who are more likely to select less selective schools than their non-first-generation peers. This suggests that the unique challenges and limited familiarity with the college application process lead first-generation students to prioritize

different factors when making decisions about their college pathways. Moreover, the study identified various fit preferences as strong predictors of undermatching among rural students. This challenges traditional undermatching theory, which tends to focus predominantly on academic matches and overlooks the importance of aligning values, interests, and goals between students and colleges in the decision-making process. When considering cultural attitudes towards higher education, fostering a supportive atmosphere, and encouraging critical thinking about the value of college education, rural students are guided to make informed decisions regarding their college pathways.

### 288 3:45 pm

#### Incorporating Culturally Relevant Pedagogy in Chemistry to Promote Success for Women of Color in STEM

**Elizabeth Nguyen, Bachelors/Chemistry and Masters/Organic Chemistry (G)**

Women of color (WOC) are often not represented in the chemistry curriculum. The STEM environment that many WOC experience is not welcoming making it difficult for WOC to navigate and continue in the STEM pathway. For example, in 2021, only 35% of women were represented in the STEM workforce while men represented 65%. These numbers go down for both women and men when race is factored in the representation (National Science Foundation, 2023). Understanding WOC experiences in STEM at Hispanic Serving Institution (HSI) postsecondary education can help mitigate the disproportionate numbers of WOC in the STEM workforce.

The purpose of this literature review is to investigate the experience of WOC in STEM at HSI postsecondary education, with a specific focus on the lack of diverse representation in the chemistry curriculum and the potential for incorporating culturally relevant pedagogy (CRP) in STEM to increase WOC representation workforce.

Findings show that WOC in STEM often experience a negative environment that highlights the cold and intimidating approaches of STEM instructors that have pushed out WOC from pursuing STEM (Herrera et al., 2022). Minoritized students and women are more likely to leave the STEM field compared to male and non-minority students (Flynn, 2016). While there is some research on the experiences of WOC in STEM, few studies examined undergraduate experiences in chemistry.

Studies reveal that many general chemistry textbooks are not inclusive or diverse. Most general chemistry textbooks highlight white male scientists and briefly mention names of women in a very small section (Gee et al., 2022). This narrative of only white men being scientists can discourage WOC to continue in the STEM pathway. To embrace equity, diversity and inclusion, using CRP such as incorporating discussion of WOC chemists can mitigate issues that WOC face in a chemistry classroom (Johnson, 2022). Studies that have explored the incorporation of CRP in chemistry found that students felt a greater connection to being a scientist and belonging in the chemistry pathway. Investigation of the literature is crucial to understand

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

how CRP in chemistry can create a more equitable, diverse and inclusive environment that can promote success for WOC.

### 289 4:05 pm

#### Breaking the Beta: A Critical Inquiry into Problem-Solving

**Gabriela Hernandez, MSED program (Math & Science Ed Doctoral) (D)**

In the realm of rock climbing, as in the arts, limitations and challenges are not merely obstacles but are integral to the creative process of problem-solving. Just as artists in constrained environments find unique ways to express individuality and spontaneity, rock climbers face embodied and environmental constraints that require inventive and adaptive strategies. This similarity underscores the enactivist view-- the epistemological framework guiding the study-- as proposed by Varela et al. (1991), that cognitive activities like problem-solving are deeply intertwined with physical experiences. Thus, the study of rock climbers' problem-solving strategies in navigating their constraints becomes a compelling metaphor for understanding mathematical problem-solving. My dissertation aims to demonstrate how facing and embracing constraints can lead to profound creativity. Specifically, my dissertation seeks to surface the significant problem-solving strategies of disabled rock climbers as a resource informing their mathematical problem-solving. The study stands to impact both math educational practices and our understanding of problem-solving across seemingly disparate domains.

### 290 4:25 pm

#### The Departmental Impact of Near-Peer Mentors

**Brinley Stringer, PhD in Math Education (G)**

Many interventions are being studied to help combat barriers into STEM fields that contribute to high attrition and low persistence rates. One such intervention is near-peer mentor (NPM) programs, which utilize undergraduate students as academic supports to fellow undergraduate students. NPMs can work in class with instructors to support students during group work, or outside of class working in a tutoring center or providing additional office hours, providing more opportunities for students to get help with class material. While studies have found that NPM programs contribute towards improved outcomes for students, and some studies have also discussed the positive qualitative impacts of such programs as reported by students, NPMs, and instructors, there is a gap in the literature studying how NPM programs make such differences. To fill this gap, my research questions are:

1. How do NPMs impact the ecologies of mathematics classes?
2. How does the NPM program impact the ecologies within a mathematics department?

For my dissertation, I investigated the Padre University (PU) mathematics department's NPM program. PU is a private liberal arts college in the Southwestern United States serving about 9000 undergraduate students. Faculty started a pilot NPM program in Fall 2022 in the mathematics department, and

funding will end after the Spring 2024 semester. On average, the math department hires 8 NPMs per semester. These NPMs work with faculty both during class time, as well as offering outside support in office hours, where students can attend and get support with homework or other course content. I conducted observations and focus group interviews with students, NPMs, and faculty to understand how the new NPM program is making impacts within the mathematics department.

Preliminary findings demonstrate that many students feel more comfortable working with NPMs compared to instructors. This in turn leads many students to seek out additional resources to support their learning of mathematics. Faculty describe NPMs functioning as a "bridge" between students and instructors as well as providing insights into the class with their unique perspective. One important implication is the potential for NPM programs to function as catalysts and vehicles for change in mathematics departments.

### 291 4:45 pm

#### When Coding Meets Biology: Student Attitudes, Motivations, and Expectations in a Discipline-Based Coding Class

**Austin Zuckerman, Ph.D. Mathematics and Science Education (G)**

With the expansion of computer and data science sectors over the past few decades, coding has become a widely demanded skill in STEM research and the broader economy. While there is much research on entry into computer science broadly, there is limited research on the unique and specific barriers facing biology majors as they are introduced to programming. To inform how we can warmly invite and retain non-CS students in computational fields, we examine student motivations for learning how to code and attitudes toward coding in a contextualized introductory programming course in biology. We leverage social cognitive career theory (SCCT) as a theoretical framework to explore individual cognitive variables (self-efficacy and outcome expectations), as well as contextual supports and barriers that influence student attitudes and motivations

The course entitled "Introduction to Python for Biologists" was accessible to non-CS majors and covered similar content to a traditional CS-1, focusing on coding examples related to biology. Notably, this course had a substantially higher enrollment of students who identified as female or as a member of an under-represented racial group than a typical CS-1 course. We applied inferential statistics on pre- and post-course surveys administered across three iterations of this course to examine the evolution of student attitudes. We also conducted focus groups (n=22) to explore students' motivations for learning to code, expectations about the course and outcomes, and overall affect toward coding. Students, on average, reported attitudes that were less aligned with a fixed mindset of computational problem-solving by the end of the course. Complementing these quantitative findings, focus group participants described their realization of the importance of maintaining a growth mindset to persevere through challenges in the coding process. One unexpected observation is that students were grappling with whether the programming skills

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learned in the course constituted “real” coding, suggesting that while such a contextualized coding class may be perceived as more accessible and improve mindsets, students may also view it as less authentic. While we hold that discipline-specific coding courses can improve equity in computing education, these findings have implications for educators who integrate coding and biology in this way.

## Session D-6

Oral Humanities, History, Literature, Philosophy

Friday, March 1, 2024 3:00 pm

Mata'yuum

### 292 3:05 pm

Harmony of Resilience: Hip-Hop, Platicas, and the Collective Narratives of Graduate Latina Friends

Jennifer Barajas, Masters of Arts in Women's Studies (G)

This study explores the personal narratives, feminist framework, and the potential of activist music within the context of platicas among a group of graduate Latina friends. Anchored in the theoretical framework of territorio cuerpo-tierra (Lorena Cabnal, 2010), the research delves into the shared experiences of violence stemming from patriarchal systems of oppression. By listening to the music and reading the lyrics we share our feelings and emotions about how Mare Advertencia Lirika's lyrics can transpass borders to women across the globe. By applying the theoretical framework, the study aims to understand the impact of activist music, particularly that of Mare Advertencia, on the emotional and cognitive responses of the participants during the platicas. Through the examination of Mare's music videos, lyrics and participant conversation, the research delves into the multifaceted function of platicas as a means of giving people a space where they can exchange narratives and work together towards group healing.

### 293 3:25 pm

Lexical Borrowings from english to spanish in Baja California (México) and Madrid (España)

Vanessa Castro, Master of Arts in Spanish (G)

Code switching is a complex linguistic phenomenon, but, at the same time, it happens to be really useful to confirm the effectiveness and complex composition of the bilingual mental lexicon. In the case of Spanish and English, spanglish was born within bilingual communities, being highly reduced in non-border areas. Speakers are generally unaware of this linguistic phenomenon, although their decisions affect the whole community. Spanglish users subconsciously choose to use or not this new language variation, which can be given at any lexical, intersentential or intrasentential level. People tend to have predisposed linguistic attitudes towards code switching and are usually difficult to identify. The present research studies lexical loans from English to Spanish that are

being used in a border region, Baja California, Mexico, and in a non-border region, Madrid, Spain. The work introduces a theoretical framework about linguistic attitudes, code switching, the matched-guise technique and previous studies that are relevant. The matched-guise technique of Lambert (1960) has been put to test to analyze the use of code switching in both contexts, including its relation with the age and gender of the speaker. The study will include 60 participants from diverse backgrounds, divided by age, gender, level of education, number of years studying English and place of birth and residence. By following this methodology, this article increases the number of studies about code switching and linguistic attitudes, since it has been acknowledged that the field is still in need of research.

### 294 3:45 pm

How to Translate a Musical?: Translating Play a Life by Ikko Ueda

Aika Tsuda, Master of Arts in Theatre Arts (G)

This research examines the best way to translate musicals and how a translator can contribute to the production, not only writing the translation but also playing the role of a dramaturg. A dramaturg is a theatrical collaborator who does research on the social, cultural, and historical context to ensure the performance is appropriate and accurate to put on stage. Translation is not only replacing the words from one language to another but also adjusting the dialogue, keeping in mind the cultural differences.

In this research, the best way to translate musicals will be examined through a case study translating a musical called Play a Life from Japanese to English. In the translation process, I will work not only as a translator but also as a dramaturg. The research process includes translating the musical, having a table reading of a draft, having a talk-back session with actors in the reading, rehearsing with actors, putting it on stage, and examining audience members' reactions. This process elucidates the cultural differences and the challenges of language barriers, and my research examines the best way to handle these challenges.

Conducting research and taking a dramaturgical approach is important in the translation process because it helps the translator to keep in mind the difference in the background knowledge with which Japanese and American audiences come to the theatre, and helps to make key decisions about the translation. While Play a Life has universal themes such as the importance of living in the moment, there are some elements of Japanese culture embedded in the script because it is set in a Japanese high school and written in Japan. It is sometimes necessary to clarify the situation of the scene because American audiences do not have the same background knowledge that Japanese audiences have. Also, the more dramaturgical research that is done, the easier it is to determine whether proper nouns with cultural context should be a) replaced by another word in the target audiences' culture, b) explained differently in the dialogue, or c) kept as they are.

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### 295 4:05 pm

"Now, by my injuries, old man!" A Dramatic Presentation, In 5 acts. As altered for the SDSU Student Symposium

**Karen Diaz de Regules, Master of Arts in Theatre (G)**

This analysis explores the representation of the father figure in 3 popular gothic works in American society between the years 1794-1830. The three scripts utilized for this essay are: Blue Beard (1811) by William Dunlap, The Castle Spectre (1798) by Matthew Gregory Lewis, and A Tale of Mystery (1808) by Thomas Holcroft. My analysis looks at the differences and similarities in characters who are father figures, and seeks to inform the representation through a historiographical approach. I contextualize the representation through popular narratives that sought to unite a nation in need for a national identity, these are: the myth of the melting pot and the myth of the founding fathers, and institutionalism. While the portrayal of the father figures varies depending on the character's race, social status, and relation to the heroine, they are all represented as holders of authority and decision makers that are allowed, to some extent, to deviate from the standards of morality the other characters are held to. The narrative present in these plays benefited individuals who were white, male, and wealthy; non male, non white characters portrayed as inferior. While modern entertainment is held to different standards of representation, many of the tropes of the genre remain present in modern media. It is important to look at the history America has with popular entertainment and the differences in representation based on a character's social class, race and gender. This way we can understand how the representation came to be, we can gain insight as to what sort of narrative and implications we are reinforcing, and we can assertively advocate for changes in representation of the media we consume.

### 296 4:25 pm

Lost Voices: The 1954 Guatemalan Coup Revisited Through Oral History

**Katia Ayala, Master of Arts in Latin American Studies (G)**

The study of the 1954 Guatemalan coup has proved to be a multifaceted phenomenon. With the rise of global political tensions stemming from the Cold War and the depleting supply of farmland for its citizens, Guatemala was placed in a vulnerable position. This state of crisis would eventually culminate with the CIA-led coup, overthrowing a democratically-elected president and replacing him with an authoritarian government. What is rarely discussed, however, are the lived experiences of Guatemalan citizens during and after such an impactful event. To best share their experiences, this study relies on the use of testimonies told by the citizens of Guatemala who experienced and were affected by the coup and its aftermath. The use of testimonies for this research will allow for a more nuanced view of the coup that goes beyond statistical data or simple historical retellings. It will focus on the personal stories of said individuals as a means to highlight the impacts of such a radical shift in the nation's social, political, and economic systems.

### 297 4:45 pm

People's engagement with primate habitat signage at the San Diego Zoo

**Nancy Quidachay, Masters of Arts in Anthropology (G)**

Zoological organizations have been around for many years, with one of their main goals being to educate people on wildlife not typically found in their everyday life. A primary mechanism used by zoos to disseminate educational information is signage. Due to zoos being big contributors to wildlife conservation, it is important to be able to assess the extent to which conservation education materials are received by people. It is therefore important to determine how effectively this staple educational tool impacts people's knowledge and long-term behavior toward conservation efforts. My research contributes to this objective by providing an analysis of how effective the zoo habitat signage is in informing people about endangered primate species at the San Diego Zoo. I used a comparative approach evaluating signage impact at three primate habitats at the zoo, to determine how their signage differs between habitats and how that might affect people's perceptions and knowledge. I specifically compared the behavior, knowledge, and opinions of zoo patrons visiting the Capuchin (*Sapajus apella*), Orangutan (*Pongo abelii*), and Lemur (*Varecia rubra*, *Lemur catta*, *Eulemur collaris*, *Eulemur flavifrons*, and *Propithecus coquereli*) habitats. My research goals were to: 1) characterize how zoo visitors engage with the habitat signage and 2) better understand how the signage present influences people's knowledge of conservation issues, for example wildlife trafficking, and their opinion on the species within a conservation context. To address the 1st goal, I spent 9 weeks during the months of April, May, and June observing zoo visitors (total of 6,958 people) to determine what proportion of patrons stopped to read the signs. I conducted 10 min focal observations using the signs as the focal subjects and an ethogram to track the behaviors exhibited towards the signs. To address the 2nd goal, I conducted 82 survey questionnaires with zoo visitors to gauge people's current knowledge. The survey questionnaires revealed that many respondents felt that while conservation is important most are unsure of how they can contribute. Respondents also noted that the signage was more useful to learn about primates as opposed to conservation. This preliminary study of human engagement with signage will allow the San Diego Zoo and other similar facilities to do a re-evaluation of their primate habitats, further extending the mission of primate conservation through enhancing how people receive information.

## Session D-7

Oral Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 3:00 pm**

Visionary Suite

### 298 3:05 pm

The Chinese American League of Justice

**Eric Vizcarra, Bachelor of Arts in History (U)**

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

This research focuses on the Chinese American League of Justice, which operated from 1909 to 1913, and the ways in which the League discursively resisted racialization, exclusion, and discrimination through their publications.

### 299 3:25 pm

#### E.C. and the Nuclear Unit: What a Difference a Code Makes!

**Grace Dearborn, Bachelor of Arts in History (U)**

A comparison of familial representations in Entertaining Comics' (E.C.) Shock Suspenstories (1952-1955) with Shock Suspenstories' successor from E.C., Tales Designed to Carry an Impact (1955-1956) demonstrates how the 1954 Comics Code changed the images of, and storylines about, post-World War II domesticity. Three main goals guide the analysis: identifying characters that express standards of beauty and domesticity, tracing storylines that depict the dynamics shared by said characters, and examining text that illuminates ideas central to the time of its creation either through its tone or wording. Augmenting the study is a review of interviews of E.C. contributors in the years following the changes the Code brought. Scholars have explored how these stories illuminate ideas of race (Whitted 2019), censorship (Yezbick 2015), and gender (Green 2012); yet none have investigated publications from E.C. with the intent of understanding how E.C. writers and artists commented on American domesticity following World War II. The issues of the post-Code Impact, while maintaining a similar formula to other E.C. stories like a 'shock ending' or 'preachy' intent, moves away from the obvious and gory depictions of domesticity — domestic abuse, disobedient, even parenticidal children, and even confronting the standards of paternity and maternity — to which readers of many pre-Code E.C. publications, specifically Shock Suspenstories, would have grown accustomed and arguably still wanted.

### 300 3:45 pm

#### Indigenous Art for Perspective

**Darya Ardehali, Bachelor of Arts in Global Humanities (U)**

Generally in Western Film, Indigenous culture is depicted as vanishing and in need of saving. Taking an American Indian Studies class, I gained insight on filmmaking techniques and their historical application in shaping a Western racist narrative of Indigenous existence. Simultaneously, I learned how Indigenous Peoples have reclaimed the narrative, using it as an empowering tool through film to claim their identity and raise awareness of cultural injustices. In Hunt for the Wilderpeople, the director, Taika Waititi uses Ricky's relationship with the P keh (slang in Maori for foreigners) to demonstrate society's power structure system and how much of that power goes to Indigenous communities, utilizing an empathetic approach for social justice.

Reading works of Indigenous scholars, I understand how particularly Western society has used recurring tropes such as the Barbaric Savage and Indian Princess trope to illustrate a temporary picture of Indigenous Existence. Waititi presents Western Indigenous tropes by portraying both Ricky similarly

and completely opposite to them. The film's comedic script and Ricky's resistance to be "conquered" by law enforcement serve as tools to powerfully challenge these stereotypes. Expanding upon knowledge gathered from interview and content analysis, my work points to how techniques like Low-key Lighting and Parallel Editing are instrumental in eliciting an emotional response to address racism and create an empathetic space. Additionally, Waititi addresses Maori racial oppression in New Zealand's Justice system, depicting Ricky as a desperate Maori orphan in search of a community. Furthermore, through costume design and setting, Waititi addresses the concepts of "Rapid Urbanization" and assimilation illustrating how these processes have violated the human rights of Indigenous people.

Waititi uses innocence and empathy in his film to address Indigenous racism, demonstrating the possibility of achieving unity and equality between races. He highlights this demonstrating Ricky and Hector's strong bond, despite their initial negative racial biases. This film provides audiences with a comprehensive view of racism from both projected and internalized perspectives. The film implied that, despite biases within diverse backgrounds, achieving unity through genuinely listening and understanding different perspectives is possible for a peaceful global community.

### 301 4:05 pm

#### Are there really Pirates in Beijing? Perceptual Dialectology of Rhoticization in Mandarin

**Brianna O'Boyle, Masters of Arts in Linguistics (G)**

Humans are perceptive creatures, based on observations we often make judgments about a person such as what their socioeconomic status might be based on their clothes, or their intelligence based on their hair color. We also do with language, and make judgements on where someone is from based on the way they speak. Some examples in English would be that people who say "cawfee" are likely from parts of the Mid Atlantic, while people who say "the" before numeric freeways would likely be from Southern California. But it doesn't only occur in English, it can be in other languages too. This study attempts to examine a specific linguistic feature of Mandarin, a process of rhotacization (r-sound) in the rime of a syllable. While this process exists in many varieties of Mandarin, such as Standard Mandarin, Chengdu, Jilu, among others, it is more frequently used in and associated with Beijing and Northern regions of China.

In order to see if people actually perceive this feature with more Northern regions of China we follow Plichta & Preston (2005) and replicate a similar methodology to test the regional association of this feature of rhoticity along a North-South latitude. Native Mandarin speakers (N=52) were presented with a word "hua" with varying degrees of rhotacization in the rime of two Mandarin words spoken by male and female speakers. The stimuli was created from recordings taken from the ManDi corpus (Zhao & Chodroff, 2022), where F-3 was manipulated to create five levels of rhoticity. After listening to an utterance the participants were asked the location of a speaker on a map with seven cities, Harbin, Shenyang, Beijing, Zhengzhou, Wuhan,

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Changsha and Guangzhou, which range along a North-South dimension. It was found that there indeed was a correlation between greater degrees of rhoticity, and more northern cities ( $p < 0.001$ ). Additionally there was an effect of participant gender where female participants in general rated the stimuli as more Northern. This study hopes to contribute to a growing body of work of perceptual dialectology, attitudes people have of regional variation, in languages beyond English.

## Session D-8

Oral Physical and Mathematical Sciences

Friday, March 1, 2024 3:00 pm

Park Boulevard

### 302 3:05 pm

SCS1++: A Tool for Assessing Learning Outcomes of Computer Science Students

David Kaauwai, Computer Science/Mathematics (U)

Assessment of learning outcomes within any discipline is paramount in evaluating the efficacy of teaching methods and the progression of student knowledge. The development of rigorous and validated assessments of formal computer science outcomes is a difficult endeavor and is one of the primary focuses of the Computer Science Education Research lab at SDSU. Computer science concepts are elusive to measure, since the concepts taught in these courses are, by nature, abstract. The Second Computer Science 1 (SCS1) Knowledge Assessment has proved to be a valuable tool for computer science educators to assess the learning outcomes of introductory computer science course offerings. Our work focuses on SCS1++, which builds on previous research completed by Dr. Miranda Parker in her work with SCS1, seeking to improve assessments of computer science education.

The nine conceptual categories that the SCS1++ is designed to assess broadly overlap. Recursive functions require an understanding of conditionals, function parameters, function returns, and logical operations. One of the several goals that we seek to achieve is an introductory computing assessment wherein those individual concepts can be measured independently. Such a tool would allow educators to gain deeper insight into what students are not understanding with much greater nuance. Instructors could then tailor their curriculum to address those deficiencies.

During Spring 2023, our research focused on cleaning, parsing, and gathering insight from data that has been collected from previous iterations of the assessment. Over the fall semester, our work focused on identifying questions that did not provide reliable assessments of student learning, and either revising or replacing those questions. We also sought to expand the question set for the nine conceptual areas that the SCS1++ has been designed to assess, both to increase the raw number of assessment items that are available and increase the range of difficulty levels across all items in each category. This presentation will serve to showcase the work that has already

been done by undergraduate students within the Computer Science Education Research lab with Dr. Parker and illustrate the necessity for this research within Computer Science as a discipline.

### 303 3:25 pm

Localized Strained Moiré Material in TMD Hybrid Monolayer-Nanotube Interfaces

Ryan Palmares, Bachelors of Science in Physics (U)

Since the simple yet revolutionary discovery of graphene in 2004, the study of 2-dimensional materials has become an exciting and upcoming field in the world of condensed matter physics. Exploiting the weak van der Waals forces between individual layers of bulk graphite to create single layer graphene, has evolved into a whole new class of 2d materials hexagonal boron nitride, and direct band gap semiconductors like transition-metal dichalcogenides (TMDs). These materials are well known for their unique photonic and electrical properties that are akin to stackable "building blocks". By stacking these 2d materials and twisting them, we create a new type of material known as moiré materials. This new type of material can finely tune its photonic and electrical properties by twisting them and is shown in stacked bilayer graphene at 2.2 degrees, turning a material of pure carbon, into a superconductor. These new materials are now being explored in quantum computing and other nano-scale devices because of these exciting discoveries.

Recent research in moiré materials has shown that twist angle can finely tune its optical and electrical properties. We can take this a step further by adding strain to the crystal lattice, creating an additional method to tune these sought after properties. The method of introducing strain into our crystal lattice is through the fabrication of two chemically identical materials, in our case a Tungsten Disulfide (WS<sub>2</sub>) monolayer flake and nanotube. By mechanically transferring the flake and stretching it across the nanotube we create a hybrid crystal structure, where we get a laterally strained crystal across the interface of the nanotube while at the same time creating a localized area of moiré material.

By being able to control the strain and twist angle via fabrication, we can create complex nanoscale devices and finely tune their properties through this hybrid interface. Such materials show potential as quantum sensors and photonic qubits for applications in quantum computing and quantum information science. As we delve deeper into the realm of 2D materials and their manipulation, the potential for groundbreaking advancements in nanoscale device design holds great promise.

### 304 3:45 pm

Material Characterization of Novel PEDOT Thin Films Produced via oxidative Chemical Vapor Deposition using Volatile Liquid Oxidants

Mary Becker, Bachelors of Science in Physics (U)

Conducting polymers have gained attention due to their metal-like conductivity, high transparency, and excellent

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mechanical flexibility. The texture and nano-structure of conducting polymers play a crucial role in their performance in technological applications. By controlling parameters such as preferential orientation,  $\pi$ - $\pi$  stacking distance, and crystallite size the charge carrier mobility can be improved. Oxidative chemical vapor deposition (oCVD) is being explored as a scalable manufacturing technique for fabricating conducting polymers with characteristics such as conformal coatings, low-temperature processing, solvent-free synthesis, and mechanical flexibility. The oCVD is a powerful method that allows simultaneous polymerization, doping, and thin-film formation, even on nanostructured materials. In the oCVD process, a monomer vapor, such as 3,4-ethylene dioxythiophene (EDOT), is introduced into a vacuum chamber along with an oxidant vapor. Commonly, vapor iron (III) chloride is used as the oxidant, which requires a postdeposition rinsing step to remove unreacted oxidants and oxidation by-products. Alternatively, more volatile oxidants like  $\text{VOCl}_3$ , or  $\text{SbCl}_5$  can be used in a true single-step, all-dry oCVD fabrication. By controlling the  $\pi$ - $\pi$  stacking distance and interchain charge transfer integral, highly face-on oriented semicrystalline poly(3,4-ethylenedioxythiophene) (PEDOT) thin films with metallic conductivity at low temperatures have been developed. As manufacturing techniques and material performance improves, characterization methods must accurately model the internal structures contributing to optimized conductivity so the development of future novel PEDOT materials can augment these features.

### 305 4:05 pm

#### The Role Iron in the Photoinitiated Growth of Silver Nanoparticles

Joseph Charlonis, Masters of Science in Chemistry (G)

Aqueous solutions containing silver ions and organic acids have long been known to be photosensitive, with the products generally being silver aggregates of varying size and shape. We have found that the inherent sensitivity is in fact lower than expected and that trace amounts of species such as iron can play a dominant role in initiating the reactions. In the present work, we show that silver nanoparticles of well-defined size and shape readily form when solutions containing silver, citrate, and iron ions ( $[\text{Fe}^{+2}] / [\text{Ag}^+] < 0.001$ ) are irradiated by violet light. Using UV-visible spectroscopy, nuclear magnetic resonance, dynamic light scattering, and transmission electron microscopy, we have carried out a detailed kinetic and mechanistic study, with an emphasis on the initial steps of growth. We discuss iron's peculiar role in the overall reaction mechanism and its final fate. We also briefly look into the influence of pH on the reaction mechanism. Absorption of light via a charge transfer transition in iron citrate complexes leads to the production of  $\text{Fe}^{+2}$  and radicals, several of which serve to reduce  $\text{Ag}^+$ . To the best of our knowledge, this is the first report of this novel synthetic route of producing silver nanoparticles.

### 306 4:25 pm

#### Kepler-8610483b: The First Potential High-Inclination Circumbinary Planet

#### Christopher Christopher Chase Martin, Masters of Astronomy (G)

Most stars in the universe exist in a binary star system, which are systems of stars that orbit each other. Approximately up to 85% of stars exist in these binary systems. Out of the over 5,000 planets that have been discovered outside of our solar system, which are called exoplanets, only 20 of them orbit a binary star system. These planets are known as circumbinary planets. In 2014, a circumbinary planet candidate was discovered using data from the NASA Kepler Space Telescope (2009-2013). The binary star system this candidate was found in is called KIC 8610483. Most of the circumbinary planets have been found by detecting the planet as it passes in front of one of the stars. This candidate does not transit, so it was found another way. It was detected because of the effect it had on the binary stars that it orbits. The gravitational pull from the planet causes small variations in the eclipse times of the binary stars. An eclipse is when one of the stars passes in front of the other. The researchers were able to determine all of the orbital parameters for the circumbinary planet, except for the orbital inclination. The orbital inclination describes how the orbit of the planet is angled in comparison to the binary stars. The goal of this project is to estimate the inclination angle using the original Kepler data alongside new data from the Transiting Exoplanet Survey Satellite (TESS) mission and ground based data. It is important to get an estimate because the exoplanet could have an orbit that is highly inclined to the orbit of the binary star system. If that is the case, then it would be the first high-inclined circumbinary planet. A planet like this would be very interesting to study, and could lead to interesting implications in planetary formation.

## Session D-9

Oral Education

Friday, March 1, 2024 3:00 pm

Pride Suite

### 307 3:05 pm

#### Science-Based Art Activities Facilitate the Development of Scientific Knowledge and Techniques in Pre-Service Teachers

Maraliz Fischler-Barraza, Math, and Science Education Joint Doctoral Program (G)

Art and science are inextricably linked throughout human history. More recent systemic reviews of the education systems have alienated artistic endeavors from scientific ones, leading learners to believe they are unrelated. While science suffers from a reputation that only a small portion of a privileged population can join, art, on the other hand, is a more welcoming field. Discrepancies between science and art have been highlighted in K-12 education. Reintegrating art and science in pre-service teacher training can be a novel resource for future teachers. In this study, I investigated how science-based art activities can help support the development of scientific knowledge in preservice teachers. I interviewed five

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undergraduate students who are also enrolled in pre-service teacher training and will graduate with their bachelor's and teaching credentials. Students participated in a cyanotype activity and were then asked to produce artist statements as part of their teacher training program. I analyzed 1) how pre-service teachers made observations of their environment using art, 2) what pre-service teachers' perspectives of their environment, and 3) how pre-service teachers think about integrating science into their lessons using science-based art activities. Findings show that pre-service teachers 1) showed enthusiasm in engaging in the exploration of their environment through science-based art activities 2) developed a collaborative environment in which they discussed the design and presentation of their cyanotype, 3) can develop a robust connection between science-based art activities and content-specific scientific knowledge. These three main findings can be closely linked to NGSS practices that pre-service teachers are expected to integrate into their curriculum. Fostering the engagement of pre-service teachers in the development and use of scientific knowledge through art activities like cyanotyping can support meaningful scientific practices in the classroom that has the potential to effect change beyond the school setting.

### 308 3:25 pm

#### “So Someone Like Me Can Be in Academia?” The Role of Mentoring in a Community College Undergraduate Research Program

**Danielle Huddleston, Joint Doctoral Program in Education (D)**

Informed by the positive impacts of HIP participation, in particular undergraduate research, and inequitable participation in HIPs (Kuh et al., 2017; NSSE, 2021; Zilvinskis et al., 2022) the purpose of this study was to understand the role of mentoring experiences in students' scholar identity development during an equity-focused undergraduate research program for first-generation and racially minoritized community college students. Drawing on Nora and Crisp's (2007) multi-dimensional framework for mentoring community college students, this evaluative inquiry explored how mentoring experiences during a research fellowship program contributed to students' (1) scholar identity development and (2) network of community support. Data are drawn from the reflections of 19 community college students.

### 309 3:45 pm

#### Empty promises, broken policies: How State and Federal legislation affects servingness at Hispanic Serving Institutions in STEM

**Daniela Hernandez, Bachelor of Arts in Interdisciplinary  
Studies (U)**

Recent research has explored multidimensional “servingness” to understand how Hispanic Serving Institutions (HSIs) intentionally support Latine students (Garcia et al., 2019). Race-conscious policies and practices are key to transforming HSIs because these institutions enroll large percentages of

Latine/x, Black, Indigenous, Asian American, and Pacific Islander students (Espinosa et al., 2019). Our project focuses on servingness, specifically examining external influences like federal and state legislation (Garcia et al., 2019). Federal and state policies are crucial in shaping servingness but are limited within racialized systems that privilege “whiteness” and colorblind racialized logic that disregards the realities of systematic racism that minoritized students of color face in the education pipeline (Garcia, 2023). Given that minoritized students are underrepresented in STEM fields, educational policies that consider the unique experiences of students are necessary to provide adequate support for minoritized students in STEM, including degree completion and career development. STEM disciplinary culture tends to be “chilly” in that it fosters competitiveness and individualistic goals and values, often resulting in a lack of representation, lower retention rates, and blatant discrimination (McGee, 2016; Ong et al., 2018). Title V and Title III have direct implications for HSI servingness. Title V program helps HSIs improve academic performance and ensure the quality of education for Latine and Pell grant-eligible students (Higher Education Opportunity Act, 2008). Title III contributes funds to increase the number of Latine and minoritized STEM students by providing additional support, such as scholarships, internships, and academic services (U.S. Department of Education, 2023).

The purpose of this literature review is to demonstrate the important role policies and practices have on promoting equitable educational opportunities and success. Legislation must be race-conscious in order to address the unique needs of minoritized students in STEM. The literature on race-conscious policies was compiled using keywords such as Hispanic-Serving Institutions (HSIs), Affirmative Action, DEI, CRT, Title V & III, policy, and race-conscious policy in OneSearch and Google Scholar databases. The importance of closing the gaps between legislation and practices to support minoritized students in STEM at HSIs will be further discussed in the presentation.

### 310 4:05 pm

#### Cultivating genuine learning: Instruction and incentives for students to constructively use artificial intelligence tools

**Alana Rio, Bachelor of Arts in Psychology and Philosophy (U)**

Given that pervasive student use of artificial intelligence (AI) tools is uncontrollable, SDSU and other universities should provide instruction and incentives for students to use AI productively. Students need instruction on how to engineer prompts, choose AI tutoring tools over AI generated answers, and critique AI output in order to gain a competitive edge both in the classroom and, later, in the job market. We need classroom discussion of how cognitive offloading and over-reliance on AI risks increased laziness, reduction in writing competence, diminished memory, and inadequate development of the foundational skills and problem solving needed to become productive citizens. Besides offering instruction in best AI practices, SDSU must take proactive steps to redesign assignments and grading assessments. Ultimately, if students

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aren't rewarded for using their own cognitive work over AI-generated submissions, then an SDSU college degree will lose value.

### 311 4:25 pm

#### Educational Frontiers: A Comparative Study of K-12 Experiences in San Diego's Diverse Neighborhoods Gabrielle Jose, Bachelor of Arts in English for Single Subject Teaching + B.A. in Comparative International Studies (U)

The proximity of San Diego to the U.S.-Mexico border provides a distinctive backdrop for research opportunities. This study dives into the intricate relationship between socioeconomic and demographic factors, such as funding inequities and the representation of certain groups in the educational landscape, focusing specifically on the impact of public K-12 schools in San Diego pursuing higher education.

A comparative analysis between affluent areas like La Jolla and Point Loma; and more economically diverse regions such as Chula Vista and San Ysidro offers insights into disparities in educational experiences. Examining transborder student mobility, this study explores how this influences enrollment patterns in local schools and the pathway to four-year university programs directly after high school. The challenges and opportunities arising from students residing on one side of the border while attending school on the other are scrutinized, shedding light on the complexities of this unique scenario.

Furthermore, the research addresses the intersection of bilingual education and special education services in San Diego. By investigating the nuances of linguistic challenges within the context of special education, this study aims to identify insight into creating more inclusive and effective educational environments.

In summary, this research endeavors to deepen our understanding of the multifaceted dynamics shaping K-12 education in San Diego. By examining socioeconomic, government funding, demographics, and college-bound pathways, this study seeks to unravel the complexities that underlie the representation and educational experiences of diverse student groups in this unique geographical position.

### 312 4:45 pm

#### Beyond Excited and Anxious: Student Influences and Emotions Towards Their Career Search Hazel Fernandez, Bachelor of Arts in Sociology (U)

The shift from college life to a professional career is a significant milestone that brings forth a blend of excitement and unease. This research postulates that emotions experienced during this phase are influenced by a range of factors, including demographic characteristics, guidance from mentors, and the effectiveness of career support services. Using a mixed-methods strategy, the study combines both numerical and qualitative information from over 2,400 surveys and 200 comprehensive interviews. The participants encompass undergraduate and recent graduate students with diverse backgrounds and academic majors. The surveys

encompassed structured surveys, while the interviews embraced semi-structured conversations to gain nuanced insights. Cutting-edge statistical methods were applied for the numerical analysis, whereas artificial intelligence tools aided in deciphering the qualitative data. Initial findings propose that the journey from college to career is notably stressful for a majority of students, regardless of their demographic profiles.

Interestingly, individuals who highlighted the significance of a mentor in shaping their career pursuits exhibited notably more optimistic emotions when it came to job hunting. Likewise, those who chose professions aligned with key aspects of their own personality experienced this positive effect. Strikingly, campus-based career services were ranked as the least influential among the various factors examined in the study. These preliminary outcomes underscore the intricate psychological and sociological elements that impact college-to-career transition. Mentorship emerges as a pivotal positive force, pointing towards the necessity for targeted mentorship initiatives within educational institutions. The limited impact of on-campus career services suggests the need for a reevaluation and potential enhancements in these programs, or heightened motivational endeavors to encourage students to utilize the existing offerings effectively. To address these revelations and provide support to students beyond just academic accomplishments, we are in the process of crafting specialized resources accessible at [www.laborlab.com](http://www.laborlab.com).



# Abstracts of Presentations

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## Session E

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session E-1

Oral Henrietta Goodwin Scholars Session 1

**Friday, March 1, 2024 1:00 pm**

Templo Mayor

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### 50 1:00 pm

Affects of Gentrification in San Diego

**DeAnza Palmer, Child Development (U)**

The disruption of minority communities in San Diego via gentrification, specifically to minority communities, creates an unstable environment for those of low income. Low income residencies are affected by the ability of gentrification to drive property costs through the roof, leaving minorities such as Black communities predisposed to these negative net changes. Within our research we will be investigating the likelihood of minorities being affected by the eruption of wealth. We will be researching articles about gentrification in San Diego, while also using statistics to prove the problem that is occurring.

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### 51 1:00 pm

Why are Black Women in Sports are Perceived Badly in The Media?

**Brenna Barnes, Bachelors (U)**

Black women in sports are more likely to be villainized in the media than anyone else. This can be detrimental to mental health, performance, and influence future generations of athletes. While conducting this research we will try to figure out why black women tend to be more scrutinized in the media and what other factors affect this issue. We will use mixed methods to conduct our research, such as analysis of interviews and case studies of various women. During our research we hope to understand why are these women treated differently and how it affects their mental health, performance, and how it creates prejudice.

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### 52 1:00 pm

Social Media Impact on black adolescent education

**Theodore Godfrey, Kinesiology pre-pt (U)**

The problem we're focusing on is how an under-representation in social media for black students or black people in STEM may discourage young black people from pursuing their goals. This also includes how certain things on social media don't reflect real life or what happens behind the scenes, and how this can affect young people's mental health. Black-American students constitute a significant demographic with substantial untapped potential. The representation of this group on social media serves as a pervasive influence, similar to an internalized narrative, which often communicates to these students that their aspirations are unattainable. Regrettably, this messaging impedes their proactive pursuit of goals, underutilizing their inherent capabilities. The lack of representation on social media engenders a sense of impossibility among impressionable Black-American students possessing considerable potential,

thereby inhibiting the realization of their ambitions. This shortfall in representation deprives their communities and limits the broader society's access to a myriad of possibilities emanating from their untapped talents. Therefore, we will explore the challenges and barriers Black students face in their journey to graduation. There needs to be calls and actions against social media platforms such as Instagram and TikTok to promote blacks and black culture in the media. We will use the black voices of those who have spoken on this matter and get insights into different points of view. We will gain intelligence from those seeking to discuss this study and expand our research.

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### 53 1:00 pm

Affirmative Action: Equity not Equality

**Milana Abdalla, Cellular and Molecular Biology (U)**

Affirmative action refers to policies and practices aimed at increasing opportunities for underrepresented groups, particularly in education and employment, to address historical and systemic discrimination. This research aims to investigate the multifaceted effects of affirmative action on African American students in higher education. Focusing on academic performance, educational attainment, and overall well-being, the study seeks to uncover the nuanced dynamics at play. By employing a mixed method, qualitative as well as quantitative, we will analyze both the positive and potentially challenging aspects of affirmative action's influence on this demographic group through interviews and surveys of different San Diego State University students. Additionally, the research will explore broader societal implications, shedding light on the complexities and challenges associated with affirmative action policies in the context of higher education at San Diego State University. This inquiry contributes to a more nuanced understanding of the impact of affirmative action on African American students and provides insights into the broader societal discourse surrounding these policies.

## Session E-2

Oral Henrietta Goodwin Scholars Session 2

**Friday, March 1, 2024 3:00 pm**

Templo Mayor

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### 55 3:00 pm

Black Students experiences within higher education

**Nyana Martin, Biology (U)**

Sentence 1- What's the problem?

Black students not being able to afford higher education.

Sentence 2- Why is this problem important?

This problem is significant because higher education is essential and leads to success. If black students do not have access to education because of financial troubles, they are at a disadvantage in having a successful career in the future.

Sentence 3- What needs to happen (study)?

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Within our research, we plan to investigate the reasoning behind Black students not being able to afford higher education.

Sentence 4- How will you complete your study?

We will complete our reachsearch by interviewing students and mentors in the Henrietta Goodwins Scholars Program. Along with doing research of experiences of Black students around the United States.

Sentence 5- How will you complete this study (specifics on what you are covering.)

We will complete this study by comparing experiences that Black students have compared to students of other backgrounds. We will be showcasing this in an oral presentation in a attempt to raise awareness to this issue.

### **56 3:00 pm**

#### **Increasing the Enrollment of Black Students at San Diego State University**

**Camryn Cabine, Undeclared - Planning to enter Public Health (U)**

Of all postsecondary enrollment in the United States, Black students make up a mere 12.5% of the population. The issue of low Black enrollment is one that is especially seen at San Diego State University (SDSU), with the Black population of the university being just 4%. Low enrollment offers some insight into the disadvantages Black students face from a young age. A quality education is often the foundation of a quality life. Higher education is essential for getting good jobs, and overall offers an even greater future to the Black community. Within our research, we plan to explore further into the disadvantages Black students face in pursuit of higher education, along with the challenges that are often faced by Black students in higher educational spaces. The study will then go on to examine the correlation between income of Black families or individuals and Black enrollment in higher education. The study will also consider other local colleges and universities with higher Black enrollment compared to SDSU, and research what those institutions might offer compared to SDSU. This study will include both quantitative and qualitative research.

### **57 3:00 pm**

#### **Is there a stigma to mental health for Black students?**

**Jhacib Blenman, Kinesiology (U)**

We will be addressing the question: is there a stigma surrounding Black Teenagers and their struggle with mental health through the transition from high school to college? Well mental health is very important in general, it breaks the stigma towards mental health. As well, it creates a cycle of unstable mental issues. The reason for this is because of how others perceive the black community as weak. As well the black teenagers/community is to be known to "suck it up" so there is this stigma from our surroundings and others influencing the black community to not talk about their mental health. The Black students believe there is no need for support to occur when in reality there is a need and importance for not just

students' mental health but Black student's mental health also. These Black students try to not seek those supportive services, even though they are provided at colleges and high schools all over the world. So from our research, we will bring awareness to these issues and make it less stigmatized for the Black students transitioning from high school to college. In hopes for the Black teenagers to be able to talk about the issues they are facing within their mental health. We will do this by studying and exploring this topic by using a quantitative study by conducting a survey as well as a meta-analysis of mental health. We are going to create a survey to seek out personal mental health issues and to understand the mental issues and possibly have a comparison to other students as well.

### **58 3:00 pm**

#### **Credit Where Credit is Due: Exploring the Factors of Misrepresentation of African Americans in Media and Pop Culture**

**Layla Jones, Bachelor/Psychology (U)**

There are significant connections with racism and the media. The challenges that African Americans have undergone in film and media have a long history. So much so, that to this present day, African Americans still struggle with representation in film and media along with additional factors such as culture vultures and cultural misappropriation. Our research problem focuses on the pervasive and systemic culture erasure of African American's cultural contributions throughout American history, with a specific focus on media and pop culture.



# Abstracts of Presentations

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## Session F

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## Session F-1

Behavioral and Social Sciences 1

Friday, March 1, 2024 9:00 am

Montezuma Hall

### 318 9:00 am 1

Over-the-Counter Hearing Aids: How user-friendly are they?

**Magdalen Acker, Speech Language and Hearing Sciences (U)**

Hearing loss is highly prevalent yet vastly undertreated among older adults. In addition to impacts on communication, unaddressed hearing loss in older adults is associated with poorer quality of life, lower self-efficacy, an increased risk of loneliness and social isolation, and greater odds of cognitive decline. Still, hearing aid use remains low (14-30%). A number of barriers exist that contribute to the low rate of hearing aid uptake, including high costs and , lack of insurance coverage. In an effort to improve accessibility and uptake, the US Food and Drug Administration recently approved a new category of over the counter (OTC) hearing aids. OTC hearing aids have been available to consumers since October, 2022. However, we still do not know the extent to which older adults can successfully carry out the self-fitting process on their own. This process may be challenging for some individuals, including those with no previous experience with hearing aids, those with limited technology familiarity, and with low health literacy. The current study is a first step in understanding the self-fitting needs of older adults. We evaluated the extent to which older adults can accurately and independently self-fit a pair of commercially available over-the-counter hearing aids. Participants included 42 adults ages 55 and older who have perceived mild to moderate hearing loss. Study procedures: participants were asked to carry out twelve basic steps in assembling and managing a pair of OTC hearing aids (e.g., download app, insert hearing aids in ears) under observation. Scoring was done by a trained rater using Likert-type scales for accuracy and independence adapted from published literature (Convery et al. 2011). Grand mean scores were calculated by averaging together the twelve individual scores, with higher scores indicating better accuracy and independence. The current study presents descriptive outcomes. Future reports will address analytical questions such as the extent to which self-fitting is more successful among participants who have experience with hearing aids. This work has the potential to contribute to improvements in the design of user-friendly OTC hearing aids and educational materials to support individuals who choose to self-direct their hearing care.

### 319 9:00 am 2

Exploring the Predictive Role of ACEs and Cognitive Ability in Posttraumatic Cognitions

**Kerris Woods, Bachelor of Arts in Psychology (U)**

Adverse childhood experiences (ACEs) have been linked to many negative outcomes, including posttraumatic cognitions.

Posttraumatic cognitions are changes in an individual's thoughts and beliefs following a traumatic event, and these changes play an important role in post-traumatic stress disorder (PTSD) and the emotional response to trauma. Previous research has also shown that the lower a subject's premorbid cognitive functioning is, the more severe their PTSD symptoms are. Therefore, the present study investigates whether ACEs and cognitive functioning assessed using a brief measure predict posttraumatic cognitions. Participants (N= 41) from San Diego State University completed self-report measures including the ACEs questionnaire and the posttraumatic cognitions inventory (PTCI), as well as the Shipley Institute of Living Scale (Shipley-2) which measures crystallized and fluid cognitive ability. We hypothesized that ACEs would significantly predict posttraumatic cognitions, such that the more ACEs one reported, the higher the posttraumatic cognition scores. We also hypothesized that Shipley-2 scores would predict posttraumatic cognitions; specifically, the lower the Shipley-2 score the more posttraumatic cognitions one would report. A multiple regression was run to examine the relationship between posttraumatic cognitions, ACEs (categorized 1-4+), and Shipley-2 scores. This resulted in a significant model,  $F(2,38) = 3.47, p = .041, R^2 = .155$ . The individual predictors were further examined and indicated ACEs ( $t = 2.62, p = .013$ ) were significant, but Shipley-2 scores were not ( $t = -.312, p = .757$ ). The current study extends previous findings by affirming the role of ACEs in posttraumatic cognitions. Importantly, the non-significant relationship with Shipley-2 scores may suggest that a brief measure of cognitive functioning is insufficient in capturing the specific cognitive processes related to posttraumatic cognitions.

### 320 9:00 am 3

Binge drinking is associated with altered neurobehavioral indices of cognitive control: Local and network - level fMRI analysis

**Ashley Simard, Bachelors of Sciences in Psychology (U)**

Binge drinking is common among young adults and refers to high intensity drinking interspersed with sobriety periods, which is associated with an array of health risks. It has been proposed that impaired cognitive control underlies the inability to refrain from hazardous drinking which may contribute to developing alcohol use disorder. Essential for flexible, strategically adaptive decision making, cognitive control is an executive function relying on the capacity to suppress automatic responses in favor of goal-relevant actions. Despite the high prevalence of binge drinking, evidence of neural alterations related to compulsive intermittent alcohol consumption is scant and our knowledge of biological sex differences is rudimentary. In order to address these research gaps, the present study aimed to examine neurobehavioral indices of cognitive control as a function of recent binge drinking history and biological sex in a large group (N = 98) of young, healthy women and men. Those who reported engaging in at least five binge episodes in the past six months were classified as binge drinkers (BDs = 49). A binge episode is defined as consuming 4+/5+ drinks for women/men in two hours. Light drinkers (LDs = 51) reported

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two or fewer binge episodes in the last six months, but were otherwise matched on demographics, intelligence, and family history of alcoholism. Participants took part in functional magnetic resonance imaging (fMRI) scans while performing the Stroop task, commonly used to probe cognitive control. Behaviorally, BDs showed lower accuracy to the high - conflict trials which suggests they may have compromised cognitive control. Voxel-wise and region-of-interest analysis of the fMRI data revealed higher brain activity in frontal brain regions and the anterior cingulate cortex in BDs, which are instrumental for cognitive control. This finding suggests that BDs may have to overcompensate in the frontal brain regions in order to maintain normative performance on the task. Suggestive of deficient decision making, these results are consistent with altered neurocognitive functioning as a result of protracted alcohol misuse. This study contributes to our understanding of the neural dysregulation associated with alcohol misuse in young adult women and men, and could inform early detection and development of interventions.

**321 9:00 am 4**

Verbal fluency varies by sex among Hispanic/Latino stroke survivors

**Rachel Membreno Almendares, Bachelor's of Art in Psychology (U)**

Background

Stroke has been associated with increased risk of cognitive decline and dementia. However, stroke outcomes may present differently across people, and women and men tend to experience different clinical manifestations post-stroke. Additionally, there are ethnic and racial differences, and Hispanic/Latinos tend to be underrepresented in this research. We aim to study the sex differences of daily functioning and cognition among Hispanic/Latino stroke survivors.

Methods

We used the National Alzheimer's Coordinating Center (NACC) dataset. We used data from Hispanic/Latino participants with stroke data. We used data from 107 women and 68 men with a history of stroke (52-97 years: SD = 8.75) collected from 2005-2015 from 16 sites. Dependent variables are daily functioning (Functional Activities Questionnaire) and cognitive scores (verbal fluency (Animals, Vegetables), processing speed (Trail A), task-switching ( Trail B)). The exposure variable was sex (male/female). We used general linear models to test for the relationships between sex with daily functioning and cognition adjusting for age, education and language.

Results

Men had worse cognitive performance on verbal fluency ( $b = -2.050$ ,  $t = -3.534$ ,  $p = 0.01$ ) than women. We did not observe any other significant differences by sex. However, we found a consistent main association of older age with worse total daily functioning ( $b = 0.61$ ,  $t = 3.339$ ,  $p = 0.001$ ) and cognitive functioning on all measures, ( $bs \geq |0.111|$ ,  $ts \geq |2.066|$ ,  $ps < 0.05$ ). Fewer years of education was associated with lower daily functioning and worse verbal fluency, processing speed and task-switching performance ( $bs \geq |0.213|$ ,  $ts \geq |2.334|$ ,  $ps$

$< 0.05$ ). Spanish testing language was associated with slower processing speed ( $b = 20.780$ ,  $t = 2.364$ ,  $p = 0.020$ ).

Conclusion:

Among Hispanic/Latino stroke survivors, men performed worse than women on verbal fluency. The results can be related to women having stronger language abilities compared to men on average and therefore may be more resilient to language changes after stroke. Additionally, women may participate in more social activities that could aid language.

**322 9:00 am 5**

Time Spent on Social Media and Its Impact on Body Satisfaction

**Drew Curley, Bachelor of Arts in Psychology (Emphasis in Industrial Organizational Psychology) (U)**

With the ever-growing involvement of social media in everyday life, several studies have explored how this increase in online "social connectedness" impacts humans. Overtime, research has repeatedly shown correlations between elements of mental health and social media use, which this study expands on. The current study explores the relationship between body satisfaction and time spent on social media with a predominantly female, young adult population. In line with prior literature, we hypothesize that there will be a significant difference in body satisfaction across groups of estimated time spent on social media; specifically we predicted those reporting higher time spent on social media would have lower body satisfaction. Participants ( $N=680$ ) self-reported the amount of time, recorded in hours per day, that they spent on social media. They also responded to questions related to body satisfaction using a body satisfaction survey. As predicted, a one-way ANOVA indicated time spent on social media does significantly impact body satisfaction ( $p=.026$ ). Post hoc analysis indicated those who reported 5-6 hours spent on social media reported significantly lower body satisfaction than individuals who spent 1-2 hours on social media ( $p= .026$ ). We also hypothesized there would be a difference in the perceived impact of social media on body image based on time spent on social media, with the body satisfaction of those spending increased hours being more greatly impacted. A second one-way ANOVA indicated time spent on social media does significantly impact perception of body self-image as a result of social media usage ( $p=.005$ ). Post hoc analysis indicates that those who spent 0-1 hours on social media reported a smaller change in perception of self-image compared to those spending 4-5 ( $p=.003$ ) and 5-6 hours ( $p=.040$ ). Results from this study demonstrate the changes in body satisfaction and perception of body image in young adults, depending on the amount of time they spend on social media daily.

**323 9:00 am 6**

The Influence of Phonetic Complexity on Speech Motor Control in Children with Cerebral Palsy

**Maya Elden, Speech, Language, and Hearing Sciences (U)**

Cerebral palsy (CP) is a neurological disorder affecting

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movement and potentially speech production. Approximately 50% of people with CP have impaired speech intelligibility. Children with CP are less intelligible when saying words with more complex sounds, potentially due to associated motor impairments. To test this hypothesis, we examined movement characteristics of words differing in phonetic complexity in children with CP and typically developing peers.

A total of 18 children (9 with CP and 9 age/sex-matched typically-developing peers; mean age = 9.03 years; SD = 3.32 years) participated, producing 78 words through a standardized speech intelligibility test. Three-dimensional articulatory movements were recorded using an 8-camera optical motion capture system.

Three low-complexity words (mean complexity score = 5.67) and three high-complexity words (mean complexity score = 14.89) were analyzed to measure phonetic complexity based on articulatory movements. Kinematic dependent variables (maximum speed, range, spatial coordination) were analyzed using custom algorithms. Separate multilevel models used age/sex as covariates, and Group (CP, TD) and Complexity (High, Low) as independent variables.

All participants have been recorded and data analysis is ongoing. Preliminary analyses from two participants with CP and two age/sex-matched typically developing peers demonstrate that all four children had faster maximum speeds for high-complexity words (mean = 55.83 mm/s, SD = 15.52 mm/s) compared to low-complexity words (mean = 41.62 mm/s, SD = 14.97 mm/s). Similarly, range of movement was higher for high-complexity words (mean = 6.21 mm, SD = 1.27 mm) compared to low-complexity words (mean = 5.12 mm, SD = 1.71 mm). However, in spatial coordination, for the two children with CP, there is less coordination for higher complexity words (mean  $r = .59$ ), and for the typically developing children, there is more coordination for higher complexity words (mean  $r = .68$ ).

Preliminary data suggests that typically developing children and children with CP have higher speeds for higher-complexity words. However, spatial coordination differs, decreasing between high and low-complexity words for children with CP, yet for typically developing children, it remains similar. Spatial coordination in children with CP may explain why they have more difficulty producing higher-complexity words.

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### **324 9:00 am 7**

#### **Automated Detection of Archaeological Sites from Satellite Imagery**

**Kylie Coughlin, Anthropology (U)**

Identifying, categorizing and analyzing surface archaeological remains at large scales is typically achieved via costly pedestrian surveys, limiting the scale of analysis. The availability of high resolution (<1m) space-borne imagery has enabled remote detection of sites, but manual identification of features is still laborious. In partnership with EyePop we will present a pilot study about how artificial intelligence can be used to automatically detect and classify surface sites. We will use the "Desert Kite" game trap sites in eastern Jordan as a case study,

which are large rock alignments easily visible in aerial imagery. Automated site identification and classification advances the capacity for low-impact, remote-sensing applications in regional to global-scale archaeological surveys and resulting geospatial analyses of past settlement, mobility, and economic activities.

## **Session F-2**

### **Behavioral and Social Sciences 2**

**Friday, March 1, 2024 9:00 am**

**Montezuma Hall**

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### **325 9:00 am 8**

#### **Age of acquisition and hearing status impact proficiency in American Sign Language**

**Ayden Kpormegbey, Bachelor of Arts in Speech, Language and Hearing Sciences (U)**

The age of acquisition for American Sign Language (ASL) varies for both deaf and hearing adults. Deaf adults with deaf, signing parents typically acquire ASL from birth (native signers), but most deaf people are born to hearing parents and acquire ASL in early or late childhood through interactions with signing peers. Hearing signers with deaf parents (Codas – Children of Deaf Adults) also learn ASL from birth, but they may switch language dominance to spoken English, becoming heritage language users. Hearing people without deaf parents typically learn ASL in early adulthood in an educational or professional setting, rather than in early childhood. To investigate whether age of acquisition and/or hearing status impacts ASL proficiency in adulthood, we gave the ASL Sentence Repetition test (ASL-SRT) to 218 signing adults. This test requires participants to repeat verbatim 35 ASL sentences that increase in length and complexity. We tested a total of 187 deaf adults (87 native signers, 64 pre-school learners, and 36 elementary school learners) and 95 hearing adults (29 Codas and 66 adult learners). The results showed that overall, deaf signers outperformed hearing signers. There was little difference between native deaf signers and deaf pre-school signers, and both groups outperformed the native hearing signers (Codas). The hearing signers who learned ASL as a second language in adulthood had the lowest ASL-SRT scores. Hearing signers (both native and late-learners) are immersed in an English-dominant environment, with less daily exposure to ASL than deaf signers for whom ASL is their preferred and primary language. This difference in daily ASL exposure likely contributes to the difference in ASL proficiency between hearing and deaf signers. Finally, these results illustrate the importance of early ASL exposure for language proficiency, particularly for deaf individuals.

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### **326 9:00 am 9**

#### **ActiveU**

**Sofia Spies, BS Biology (U)**

Introduction: Physical activity plays a crucial role in maintaining

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overall health and well-being, yet many American college students struggle to engage in regular physical activity. Sedentary behaviors and a decline in physical activity levels during the college years have become a growing concern for public health. Understanding the factors that influence physical activity behaviors among this population is essential for designing effective interventions to promote a healthier lifestyle. This study aimed to investigate the barriers and facilitators to physical activity from the perspective of American college students.

**Methods:** Data were collected from July to August 2023 using semi-structured individual interviews with undergraduate students (n=7) in California. Interview guides were developed according to study goals, informed by a literature review, and adjusted as necessary throughout data collection. Open-ended questions elicited perspectives on barriers and facilitators to physical activity. Interviewers began with a brief introduction and then explored participants' current physical activity levels, perceived barriers and challenges to engaging in regular physical activity, motivational factors, awareness of campus recreational facilities, and any prior experiences with physical activity programs. Additionally, participants were asked to share their thoughts on potential strategies to promote physical activity on campus.

**Results/Conclusions:** Participants included 7 students aged 20-23 years. About 71% of participants were female, and 57% White. About 71% of students were living off-campus, and 42% reported that they commute to campus. Over 70% were working at least 10 hours per week. Using an iteratively developed codebook, data will be coded, thematically analyzed, and synthesized.

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### 327 9:00 am 10

#### Consultation Protocols as a Strategy for Indigenous Groups in Latin America to Protect their Rights and Territories

**Jacob Gallardo, Bachelor of Arts in Psychology (U)**

Transnational networks of non-state actors are using the ILO Convention No. 169 as a powerful instrument of environmental governance to protect natural resources and communities who depend on them. The convention establishes the norm of Free, Prior, and Informed Consultation (FPIC). Indigenous, Tribal and Traditional peoples in Latin America write consultation protocols to demand that their governments uphold this international treaty. In this research, we analyze the relations between government discourse and practice. This analysis relies on secondary data through the method of process-tracing, which requires close familiarity with government statements, media articles, and other documents. We also use document analysis to map the actors involved with consultation protocols with the goal of understanding how their connections increase their political influence. Thus analyzing a new case of norm diffusion through the usage of social network analysis (SNA) to map relations of multiple actors involved in creating consultation protocols and diffusing the said FPIC norm. The SNA analysis demonstrates the perceptive interactions of how numerous actors collaborate to diffuse this norm and influence

environmental decisions. Consultation protocols have become one of the most important documents in the true application of the ILO Convention No. 169 in Latin America. The diffusion of the FPIC norm has allowed space through the understanding of the transnational networks that promoted the consultation protocols. This research shows how various Indigenous and Traditional communities in Latin America are using international law to protect the environment and their cultural rights.

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### 328 9:00 am 11

#### Navigating Cancer Care at the US-Mexico Border

**Julio Aguilar, Psychology (U)**

Cancer is the leading cause of death among Hispanics in the US, accounting for 20% of all Hispanic deaths in 2019. Hispanics have higher rates of getting and dying from certain cancers than other ethnicities, including cervical, liver, and stomach cancers (CDC, 2023). Barriers to healthcare for Hispanics include language barriers (Hall et al., 2022), lack of paid sick leave (Berdahl, 2021), and lack of health insurance (ASPE, 2021). These factors may be exacerbated in rural regions along the US-Mexico border where largely immigrant populations face both structural and cultural barriers to attaining healthcare (Collins et al., 2008). Structural factors include poverty, lack of transportation, poor working environments, and educational barriers resulting in reduced health literacy. Cultural factors may include gender roles and expectations, and misconceptions about cancer, including both its causes and treatments (Dein, 2004). In this study, we conducted semi-structured interviews with 20 individuals who have or had cancer residing in the Imperial Valley, CA. The Imperial Valley is a rural agricultural region 120 miles east of San Diego which borders on Mexicali, Mexico. 85% of residents identify as Hispanic with 76% speaking a language other than English at home (US Census Bureau, 2019). 22% of the population lives below poverty with an unemployment rate of 17.7% (EDD, 2020). Our interview protocol examined how structural and cultural factors in this region shaped participants' experiences with cancer. This included questions designed to elicit participants' explanatory models of cancer (e.g., its definition, causes, and treatment) and their experiences with healthcare, including their use of different types of healthcare treatments on both sides of the US-Mexico border. All interviews were audiorecorded and then transcribed and analyzed using thematic coding. In this presentation, we focus on how structural factors, including a lack of specialized healthcare facilities and healthworkers, and problems with health insurance resulted in frequent misdiagnoses and diagnostic delays, leading to worse health outcomes. Nevertheless, we demonstrate how some participants exercised agency within these constraints by using healthcare services on both sides of the border and in San Diego. These results will help healthworkers address health disparities in this region.

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### 329 9:00 am 12

#### Veteran Military Leaders' Perceptions of Their Subordinates' Mental Health Care Use: A Qualitative

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Investigation

### Hayley Myers, Psychology (U)

The unique demands that active-duty service members face (e.g., deployment) make them susceptible to experiencing mental health issues (Prigerson et al., 2002). However, not all service members who experience mental health issues seek treatment (Hoge et al., 2004). One possible reason for this is stigma associated with mental health care use, which may be reinforced by military leaders (Britt et al., 2012; Chapman et al., 2014). However, our understanding of military leaders' opinions about mental health care in the military is limited. In one study, Westphal (2007) interviewed a group of U.S. Navy leaders to examine their attitudes about their subordinates' (i.e., lower-ranking service members) mental health care use. He found that leaders' attitudes were influenced by their responsibility to maintain combat-ready troops, not stigma towards mental health care (Westphal, 2007). Because research on this topic is limited, the present study is guided by the following research question: What are military leaders' perceptions of their subordinates' mental health care use, and how might those perceptions influence their interactions with subordinates? This qualitative investigation will involve the use of virtual focus groups to explore the perceptions of 10-20 Veteran military leaders regarding their subordinates' mental health care use. The data will be analyzed using thematic analysis and the results of this study will inform future research that may impact the military community on a larger scale.

### 330 9:00 am 13

#### Investigating the Behavioral Response to Visual Object Stimuli ("In Progress")

##### Lauren Magliocco, Bachelor of Arts in Psychology (U)

Our neural systems that comprehend visual information and produce a response undergo complex processes in milliseconds. While research investigating object recognition goes back decades, more recent studies of object recognition have used megastudy approaches, which examine very large sets of participants viewing vast amounts of stimuli. Our current study involves 38 participants viewing 900 images of objects. To establish familiarity measures for these objects, we collected normative data from a unique set of participants. These participants were asked to provide a naming label and rate the familiarity of each object on a seven-point Likert scale. A median split was then performed to create groups of low and high familiarity objects. In the current study, we compare the reaction times and accuracy of high and low familiarity objects. Participants completed a picture naming task where they were asked to verbally produce the name of the objects. We expect analysis of variance (ANOVAs) to reveal differences in the average reaction times and accuracy of high versus low familiarity objects such that objects with high familiarity ratings will produce faster reaction times than those with low familiarity ratings. Similar to lexical frequency, more frequent exposure to objects, thus more familiarity with the objects, may strengthen their semantic networks, making these networks more robust and, in turn, leading to faster responses.

### 331 9:00 am 14

#### How do Latine Mothers Use Social Media to Support their Parenting and Children's Learning?

##### Marquita Scott, Major bachelor's in child and Family Development Minor Counseling and Social Change (U)

Mobile screen technologies, such as smartphones and tablets, are virtually universal among families in the United States. Although extensive research has investigated the number of devices owned by families with different socioeconomic statuses, limited research has explored how parents utilize these technologies to support their parenting experiences. Research is particularly lacking among ethnoracially diverse parents, such as Latines who are the largest ethnoracial minority in the US. Given the multiple features afforded by these technologies, such as instant access to the internet, social media, and contacts, mobile screen technologies might serve as a tool that Latine parents use to support their parenting. This poster delves into an investigation focused on clarifying the ways in which socioeconomically diverse Latine mothers with children under the age of five leverage social media platforms to enhance their parenting experiences and foster their children's early learning. Eight self-identified Latine mothers, each with at least one child under five, participated in semi-structured interviews conducted in English or Spanish. The interviews were meticulously audio-recorded, transcribed, and subjected to coding techniques to discern prevalent themes about the use of their social media platforms. Preliminary findings suggest a multifaceted landscape of digital maternal support, shedding light on the diverse strategies employed by Latine mothers in navigating the realms of parenting and early childhood education through social media platforms. These findings indicate that social media might be a viable source for providing Latine mothers with access to information and resources.

## Session F-3

### Biological and Agricultural Sciences

Friday, March 1, 2024 9:00 am

Montezuma Hall

### 333 9:00 am 16

#### Role of macrophages in the development of ovarian cancer stem-like cells during chemotherapy

##### Isabella Amador, Biology (U)

Ovarian cancer is a poorly understood disease with 75% death rate when identified after metastasis. Drug resistance and tumor recurrence are likely due to cancer stem-like cells (CSCs) that evade chemotherapy and induce relapse with phenotypes that are distinct from bulk tumor cells. It remains unclear how CSCs facilitate relapse and what role the tumor microenvironment (TME) plays in this process. Our preliminary data show that a secreted cytokine, tumor necrosis factor-like weak inducer of apoptosis (TWEAK), and its receptor Fn14 are over-expressed in ovarian tumors and increase after chemotherapy. TWEAK is a strong inducer of stem cell features and enhances survival

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of CSCs during chemotherapy exposure. The source of TWEAK has not been clarified, although clinical data from human ovarian tumors show that TWEAK mRNA was primarily observed in a subset of infiltrating immune cells known as tumor associated macrophages (TAMs). When we evaluated TWEAK expression in cells found in the ovarian TME, including PBMC and THP-1-derived macrophages, IMR-90 activated fibroblasts, and ovarian cancer cell lines, we found that PBMC macrophages were the primary source of TWEAK production. Since cytotoxic chemotherapy can enrich for different TAM populations, we propose that TWEAK producing TAMs support CSC survival and expansion and contribute to the high rate of relapse in ovarian cancer patients. We further found that treatment with a small molecule inhibitor of TAM polarization leads to decreased TWEAK production, fewer CSCs, and prolonged remission in mouse models of ovarian cancer relapse as compared to vehicle. Currently we are testing whether knockout of Fn14 in ovarian cancer cells co-cultured with TAMs reduces stem cell features dependent on TWEAK-Fn14 signaling. Identification of immune populations responsible for TWEAK production could lead to new therapeutic strategies for patients with high rates of relapse.

**334 9:00 am 17**

### Visible Light-mediated Quantum Dot Photocatalysis for Plastic Wastes Upcycling

**Jingtong Chai, Bachelor of Biochemistry in Chemistry (U)**

Plastic materials have become ubiquitous and indispensable due to their low-cost, long-term stability, and processability. Using poly(ethylene) terephthalate (PET), which has been widely used for making water bottles, as an example, ~80% of plastics are discarded and accumulated in the natural environment after use. The accumulation of those waste cause severe environmental pollution due to their non-degradable nature. Upcycling plastic wastes into value-added products is urgently needed. Photocatalysis has been recognized as an attractive and promising approach that can harness solar energy to drive redox reaction and produce clean hydrogen fuel (H<sub>2</sub>).

Herein, we developed a plastic wastes upcycling strategy driven by visible light with quantum dots as catalysts in aqueous solution. In this research, the commonly used PET plastic was employed as the substrate, which undergoes a base-catalyzed hydrolysis reaction to produce ethylene glycol (EG) and terephthalate (TPA). Furthermore, ethylene glycol was oxidized to aldehyde intermediates, which could further react with nitrogenous nucleophile (such as, ammonium hydroxide, hydroxylamine, etc.) to produce valuable C-N bond products, meanwhile, clean H<sub>2</sub> fuel was generated via proton reduction reaction. This research provides a novel perspective for plastic wastes upcycling to value-added products.

**335 9:00 am 18**

### Understanding gut colonization and adherence by a microbiome bacteria in the *Caenorhabditis elegans* model

**Jace Buxbaum, Cellular and Molecular Biology (U)**

We understand that bacterial colonization of the gut is conserved across animals, but the actual mechanism and mode of bacterial adherence in the gut is less understood. We use the model organism *Caenorhabditis elegans* to study microbiome bacterial adherence in the gut due to several experimental advantages, including transparent body, genetic amenability, and a short reproductive cycle. We found a species of microbiome bacteria, *Lelliottia jeotgali*, that colonizes the intestinal lumen of *C. elegans* in the wild (found on the SDSU campus!) by adhering to the intestinal cells.

To understand the genetic basis of bacterial adherence in the gut, the lab initially performed a forward genetic mutagenesis screen to identify *C. elegans* mutants that lost colonization by *L. jeotgali*; these mutants were termed adhering bacterial colonization deficient (abcd). Because one of the mutations identified was in a notch-like gene, called *abcd-8*, and notch is involved in cell signaling, we hypothesize that other genes interact with the notch signaling pathway to regulate bacterial adherence in the gut. To test this hypothesis, we performed a suppressor mutagenesis screen to identify mutants that regained wild-type-like adherence, such that the notch (*abcd-8*) mutation has been suppressed. We performed chemical mutagenesis of *abcd-8* animals and screened ~16,000 haploid genomes for bacterial colonization. From this screen, we isolated ~80 potential mutants, with 20 being validated by secondary screens to have regained *L. jeotgali* adherence with similar levels as wild-type. Next, we plan to identify the alleles in these 20 candidate suppressor mutants by performing whole-genome sequencing. We expect to determine genetic interactors of the notch-signaling pathway that play a role in intestinal colonization through adherence by *L. jeotgali*.

Overall, my project focuses on an identified putative notch signaling pathway that plays a role in niche formation in the gut. The results from this project could help determine if the role of notch signaling in microbiome bacterial adherence is conserved in other species such as mice and humans. In the future we may be able to utilize this pathway to regulate bacterial colonization with beneficial health outcomes in humans.

**336 9:00 am 19**

### Seed depth limits emergence of an invasive shrub in Southern California

**Allison Allain, BS - Biology (U)**

Invasive species negatively impact biodiversity and ecosystems. Bridal broom (*Genista monosperma*) is an emerging invasive species in Southern California chaparral habitats. This large shrub, native to the Mediterranean region, forms monocultures that threaten native species and can become major fire hazards. Effective removal strategies to reduce these threats require knowledge of *G. monosperma* seed germination. This study used a greenhouse experiment to test *G. monosperma* seed emergence rates at three different depths beneath the soil surface. Seeds 2.5cm and 7.5cm deep had significantly higher emergence rates compared to 12.5cm, indicating that 12.5cm is below the limit at which *G. monosperma* can successfully emerge. Additionally, we observed that successfully germinating seeds swell during the germination process and become

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significantly larger than non-germinating seeds, which can help identify broken dormancy prior to emergence. Knowing the depth limits of *G. monosperma* seed emergence provides novel information about their ecology and allows us to take new steps towards developing eradication strategies for the seed bank, such as soil heat treatments.

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### 337 9:00 am 20

#### Observational Study of Dorsal Abdomen Hairs: *Micrathena* vs. *Gasteracantha* and Their Differences Under SEM

**Francesca Hoang, Bachelors in Applied Arts and Sciences (B.S.), Microbiology (U)**

Question: If *Micrathena* and *Gasteracantha* are both in the orb-weaver family but relatively distantly-related, then would sensory hairs be more similar or different when compared to each other?

Hypothesis: Since *Micrathena* and *Gasteracantha* are relatively distant evolutionary relatives within the orb-weaver family, it's likely the dorsal abdomen hairs between the two genera are going to have some physical differences and similarities.

Background: In general, spiders have different hairs on their bodies with different functions. Typically, the hairs on the legs have the most variety of function. However, the function for abdomen hairs in particular can vary depending on how they grow. Abdomen hairs that grow out of a socket and are flexible are likely mechanosensory hairs (giving the spider the ability to feel their surroundings like vibrations). On the other hand, abdomen hairs that don't grow out of a socket and aren't as flexible are likely structural hairs (i.e. hairs that protect the spider from debris). In this project, the structure of hairs growing on the dorsal abdomen was observed to discover what type of hair grows on the abdomen between two genera of orb-weaver spiders: *Micrathena* and *Gasteracantha*.

The spiders were observed under a secondary electron microscope (SEM) in order to observe the physical traits between the two genera and to collect new information about these spiders. SEM is a powerful microscope with greater magnification, depth of field, and resolution compared to a traditional light microscope. The goal of this project was to learn more about both genera of orb weaver, partially due to the lack of studies conducted on them so far. In general, SEM is typically used for microscopic samples or forensic analysis, not so much insects/arachnids. As a result, using SEM on understudied spider specimens was the perfect opportunity to discover and expand upon previous research for these spiders.

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### 338 9:00 am 21

#### Generation of patient specific and transplantable hematopoietic stem and progenitor cells

**Xuefan Shi, Bachelor of Cellular and molecular biology (U)**

Generation of patient specific and transplantable hematopoietic stem and progenitor cells via differentiating embryonic stem cells.

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### 339 9:00 am 22

#### Searching for new bacterial pathogen with a Host-Bacteria Interactions Workshop

**Yesenia Rodriguez, Chemistry with an emphasis in Biochemistry (U)**

The Luallen Lab is an active Microbiology and Genetics lab at San Diego State University. It

provides first-generation college students the opportunity to experience and conduct discovery-based research by studying host-bacteria interactions using the *Caenorhabditis elegans* nematodes as the model organism. *C. elegans* are a great organism to study because they are microscopic, easy to maintain, and remain transparent throughout its short life span, which allows rapid study for host-microbe interactions and the viewing of in vivo infection and colonization. The lab created a Host-Bacteria Interactions workshop to allow students the opportunity to sample wild nematodes from rotting fruit and plant substrates from different locations around campus and discover new bacterial species that interact with these animals. As part of this workshop, we found and isolated wild nematodes and analyzed them via microscopy. We were able to see how the bacteria infection looks like by conducting fluorescent in situ hybridization (FISH) to the bacterial 16S ribosomal RNA. We then used PCR with metagenomics to identify these new bacterial species. We recently sampled an area we call the "secret garden" near the North Education building on campus and found a bacteria that appeared to cause the head of the nematodes to detach from their bodies. This was a very interesting and novel phenotypes we had not seen in previous workshops. We plan to conduct metagenomics to identify this new, potentially decapitating bacterial species. Overall, the objective of the workshop is to support and actively encourage first-generation undergraduate students to conduct research and give them the opportunity to develop and strengthen a new set of skills for future career-related areas while they are still pursuing their bachelor's degree.

## Session F-4

Engineering and Computer Sciences 1

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

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### 340 9:00 am 23

#### Comparative Evaluation of Lunar Regolith-Based Tiles for Lunar and Launching Pads: Static Load and Thermal Performance Analysis

**Shezreen Khan, Aerospace Engineering (U)**

As space agencies and private companies increasingly focus on lunar exploration and potential human settlement, the need for robust and sustainable lunar infrastructure becomes paramount. Landing and launching pads are critical components of lunar infrastructure, providing a stable surface for spacecraft operations. Thus, developing suitable materials and manufacturing methods for these pads is crucial to ensure

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safe and efficient lunar missions.

The main objective of this research study is to investigate the structural and thermal performance of two distinct types of tiles designed for lunar and launching pads. The tiles were subjected to rigorous testing under static load conditions and evaluated for their thermal performance to simulate rocket landings on the lunar surface. Static load tests were conducted to evaluate the structural integrity and load-bearing capacity of the tiles. The results indicated that both types of tiles showed satisfactory strength and resistance to deformation under various load conditions. Additionally, thermal performance analysis was performed to assess the tiles' ability to withstand the extreme temperature variations experienced during rocket landings. The findings revealed that both types of tiles exhibited excellent thermal stability and maintained their structural integrity under thermal stress.

Based on the outcomes of the study, it can be concluded that both types of lunar regolith-based tiles demonstrated promising results in terms of their static load-bearing capacity and thermal performance. These findings contribute to the development of reliable infrastructure for future lunar missions and pave the way for sustainable lunar surface operations. Further research is warranted to explore the long-term durability, environmental resilience, and scalability of these tiles. Additionally, efforts to optimize their manufacturing processes and enhance their performance characteristics should be pursued to maximize their potential for supporting lunar exploration and settlement activities.

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### 341 9:00 am 24

#### Analysis of Dry and Wet Weathered Plastic Marine Debris using Scanning Electron Microscopy

**Trinity Magdalena-Weary, B.S. Environmental Engineering (U)**

The motivation to study marine debris is multifaceted, encompassing environmental, economic, social, and public health concerns. Understanding the fragmentation and degradation of marine debris is crucial in formulating effective strategies to mitigate its adverse effects on marine ecosystems and human well-being. Scanning electron microscopy (SEM) was used to study the surficial properties of marine debris, including grazing, pitting, and other evidence of mass loss, in ten types of marine debris after 9 months of outdoor exposure in wet, submerged and dry conditions. The ten types of marine debris included: plastic bags, bioplastic, tents, blankets, styrofoam, to-go containers, water bottles, cigarette butts, and masks. In response to weathering, the physical properties of several materials demonstrated clear changes in comparison to their pristine state. Surface textures under pristine conditions were relatively flat and smooth, with occasional grazing, cracks, or fractures. For example, the surface texture of pristine styrofoam consisted of smooth, bubble-like pores of assorted sizes. Upon exposure to environmental conditions, the bubble-like pores showed varying degrees of cracking, with the highest level of degradation observed under dry conditions – to the extent that no bubble pores could be identified across the surface. By contrast, bubble pores in styrofoam submerged in creek water were flattened, but still identifiable and experienced

less cracking. In general, similar patterns were observed across all materials, such that those exposed under dry conditions consistently demonstrated higher prevalence of flaking, cracking, and crazing (fine cracks on surface), and materials exposed to wet conditions developed biofilms that appeared to protect their surfaces from weathering. The implications of these findings suggest that materials exposed to dry conditions in the natural environment, including litter and debris scattered across land, may experience greater degradation in comparison to materials that remain wet, including those that have been deposited within aquatic systems. In order to minimize the pervasive impacts of microplastic debris in waterways, the most effective management practices should prioritize clean-up of materials found among dry environments, such as along river margins.

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### 342 9:00 am 25

#### Fabrication of Patient-Specific Aorta Models for Flow Visualization

**Audrey Meador, Mechanical Engineering Bioengineering Emphasis (U)**

Complications resulting from the implantation of cardiovascular medical devices include stroke from blood clots that form where the device interfaces with the native tissue. These clots, or thrombi, result from disturbed flow patterns that include slow flow, called stasis, and high rotational flow called shear. Complex flow phenomena are challenging to study in patients thus models of the anatomy are used to recreate and measure the flow patterns using an engineering method known as particle image velocimetry (PIV). The goal of this project was to recreate the aortic anatomy of a patient with a left ventricular device in a transparent soft material for PIV. Starting with a CT scan, the boundary of the aorta was segmented and used to recreate the geometry for 3-D printing. Each aortic model was printed with PLA on the Creality Ender 3 Neo Printer and the surface coated with wax to ensure a smooth surface. Dip molding of the model with a platinum-catalyst silicone material (Sorta-Clear 40) was performed to fabricate a thin, transparent flexible version of the aorta. For this process, the Sorta-Clear 40 was tested with 0%, 5%, 8%, and 10% thinner. The 8% thinner solution formula was chosen as it preserved shore hardness and exhibited low viscosity for molding. Once the two-part silicone solution and thinner are combined, the silicone is degassed in a vacuum chamber at 29 inHg for 20 minutes to remove bubbles that introduce tears and disrupt PIV imaging. Each 3-D printed and coated aortic arch is suspended for the dipping process. Four Arches are dipped simultaneously within a 15-minute time window as the silicone approaches the end of its working time. The silicone models are cured overnight and removed with oil. These models are then placed in the mock loop system for imaging. The final transparent silicone model of the aortic arch, with an adjusted outflow graft angle of 60°, demonstrated sufficient clarity for effective PIV imaging. These models can successfully replicate patient-specific cardiovascular conditions in a benchtop setting, offering a valuable tool for studying thrombosis risks associated with cardiovascular implants.

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**343 9:00 am 26**

**Creating an Automated Water Current Setup to Assay Rheotaxis in Planarians**

**Roberto Burciaga, Bachelors of Engineering in Mechanical Engineering (Bioengineering) (U)**

The planarian *Schmidtea mediterranea* (a non-parasitic flatworm) is an excellent model to study the roles of genes in stem cell-based neural regeneration due to their molecularly diverse nervous system and excellent capacity to regrow missing neurons and sensory organs de novo following amputation. We study how dysregulation of gene expression causes changes in planarian neural function by determining if there are changes in phenotypical planarian behaviors following RNAi knockdown of genes that might be necessary for neurogenesis or neural function. Thus, we use assays to study planarian behaviors, such as negative phototaxis (movement away from light), chemotaxis (altering distance from certain chemical stimuli), and various mechanosensory modalities, including thigmotaxis (reaction to touch). Previous work in our lab used an assay to test for changes in mechanosensation using a rheosensory assay (sensing water flow) by manually pipetting along the planarian's dorsal surface (the top of the worm where the rheosensory organ is located) to see if they contracted their bodies. However, this assay had technical variability due to having users recreate conditions between trials. Therefore, we wanted to design a standardized setup to test rheosensation. Some planarian species exhibit positive rheotaxis (orienting their bodies toward a stream current). First, we determined that wild-type *S. mediterranea* does exhibit positive rheotaxis in culture, and larger worms perform better in the assay. Our trials consisted of 2-minute stirrings for clock- and counterclockwise demonstrated the highest positive rheotaxis at 1 minute, with 76.7% of 20 planarians testing positive. Interestingly, we also found that a longer duration in the current increased the likelihood the worms would glide against the direction of the applied current. We tested *pkd1L-2*(RNAi) worms, which are defective in an ion channel necessary for rheosensation, and found a significant reduction in positive rheotaxis. Our results indicate that this new assay is promising to measure changes in mechanosensory neuron function in planarians. To further test we can effectively reduce user variability and higher confidence in our assay, we are developing an automated stirring machine so that the magnitude and duration of the water current are consistent between experiments.

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**344 9:00 am 27**

**Bridging the gap between engineering and society: communicating earthquake risk via media**

**Alyssa Yearick, Bachelor of Science in Business Administration - Marketing: Specialization in Integrated Marketing Communications (IMC) (U)**

To minimize the impacts of disasters, it is crucial to understand how effectively information is communicated, especially in the context of seismic events and for a broader range of communities, including those with minority-majority

populations. Recent global disasters, e.g., the 2023 Turkey earthquake sequence and the 2021 Haiti earthquake, underscored the urgent need to educate society about preparedness; specifically, clear discursive constructions in natural disasters established at the scientific level are necessary to develop effective, diverse and inclusive information strategies to address language barriers during times of crisis, ultimately reducing injuries, minimizing property damage, and providing diverse communities with long-term seismic resilience.

In the context of the pre-event phase, this project leveraged the collaboration between journalism and earthquake engineering researchers to investigate how earthquake-related information is conveyed and received amongst diverse communities. Considering that risk perception varies temporally and within cultural context, this research focused on understanding earthquake risk communication in the San Diego region, where approximately one-third of the population is Spanish-speaking, and more than 100,000 people cross the US-Mexican border every day to go to school and/or work. An M6.9 earthquake scenario simulation for the Rose Canyon fault, running through downtown San Diego to Mexico, was first considered to quantify the local earthquake risk and identify the communities critically affected. Further, by analyzing media coverage of earthquake risk over the past decade, this research explored strategies for effectively communicating seismic risk to the diverse population in San Diego, also seeking feedback within the community. The results of this multi-level analysis highlight the importance of developing diverse and inclusive approaches to effectively convey essential seismic risk information and creating a communication landscape able to minimize disruptions, accelerate recovery, and contribute to the preparation efforts of the San Diego 2050 vision.

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**345 9:00 am 28**

**Machine Learning Models for Predicting the Yield Strength and Young's Modulus of High Entropy Alloys**

**Oscar Osuna, Bachelor of Science in Mechanical Engineering (BSME) (U)**

High Entropy Alloys (HEAs) are a type of material with a lot of promising engineering properties that consist of multiple principal elements. A normal HEA will have 5 different elements ranging from 5 weight percent to 35 weight percent. This leads to HEA having a wide range of possible compositions making it difficult to identify useful compositions calling for an efficient high throughput method for alloy screening and selection. This project focused on identifying and optimizing different machine learning models to identify the compositions with the highest yield strength and Young's Modulus. Molecular Dynamics simulation was used to create the dataset for the machine learning models.

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## Session F-5

Engineering and Computer Sciences 2  
**Friday, March 1, 2024 9:00 am**  
 Montezuma Hall

**346 9:00 am 29**

### Development of Laboratory System for Engineering Guided Waves in Shear Wave Elastography for Enhanced Soft Tissue Diagnostics

**Paul DeStefano, B.S. Molecular and Cell Biology (U)**

Cardiovascular diseases (CVD) are one of the world's leading causes of fatality; therefore, there is an increasing need for non-invasive diagnostic and monitoring techniques to apply in the clinical setting to improve their prevention/ early diagnosis.

Ultrasonic Shear Wave Elastography (SWE) allows for non-invasive diagnostics of numerous diseases. Currently, it is primarily utilized for breast and liver tissue stiffness monitoring with calibrated devices such as FibroScan© (liver). According to the literature, atherosclerosis/ stenosis can be clinically indicated by dense/ hardened tissue; thus, arterial SWE allows for a clinician to non-invasively monitor/ diagnose these diseases. SWE application to other organs with more complex geometries (i.e. arteries), though, poses additional challenges. Ultrasonic guided wave propagation needs to be considered due to arteries' viscoelastic and cylindrical characteristics.

This project aims to reproduce arterial SWE capabilities in laboratory settings. Literature review has been performed to manufacture arterial phantoms with representative human geometry and material properties. A mock-up system has been engineered to perform ultrasonic imaging and SWE on bulk and manufactured arterial phantoms. Different imaging and SWE parameters have been studied to calibrate image quality and frequency bandwidth to enable accurate SWE measurements. The system will provide a flexible and controllable platform to study arterial SWE by further engineering guided waves for enhanced soft tissue diagnostics.

If applied in the clinical setting, SWE will allow for accurate monitoring/ diagnosis of CVD by quantifying stiffness values of arterial tissue and enable non-invasive prevention of fatal disease.

**347 9:00 am 30**

### Quantum Leap in Strategy: Reshaping Arms Races and Advertising with Quantum Game Theory

**Samuel Braude, Computer Science (U)**

In the world of decision-making, game theory helps us understand how people, teams, or groups make choices and work together or compete. In the realm of strategic dynamics, the Arms Race represents a compelling application of game theory, exploring the competitive escalation of military capabilities between entities. This concept delves into the intricate decision-making processes that drive nations to build up their arsenals in response to perceived threats, illuminating

the complexities of global security dynamics. Shifting gears to the business landscape, game theory offers valuable insights into the strategic dance of Advertisement. Analyzing how companies strategically position and promote their products, this application sheds light on the competitive maneuvers within markets, showcasing the multifaceted interplay of pricing, branding, and consumer behavior in the realm of advertising strategies. In this research, we delve into obtaining the solution for both the games using a quantum approach. Our algorithm utilizes quantum entanglement and Pauli-Y gates to create a wave function that models each player's unique strategies for decision making. Moreover, the incorporation of a Quantum Algorithm and Quantum Computing introduces innovative approaches in the application of Quantum game theory, leading to transformative strides in achieving Nash Equilibrium solutions, marking a revolutionary advance in strategic decision-making.

**348 9:00 am 31**

### Collection of sEMG dataset for Silent Speech Recognition

**Alexander Cherry, Bachelor of Science, Mechanical Engineering (U)**

Silent speech recognition (SSR) aims to recreate speech from non audible signals. The objective of the 2023 summer undergraduate research program was to gather datasets utilizing signals from surface electromyography (sEMG) to train and evaluate machine learning models for SSR. Signal collection was done with a custom wireless recording device. Software for the collection and processing of the dataset was implemented in python.

Increasing accuracy in SSR is critical to the usefulness of this technology. Recording high quality datasets is challenging due to issues with noise introduced by mains voltage and issues with electrical contact with the skin. To mitigate the impact of the 60hz noise, the recording system was run on battery and moved away from sources of electrical noise. Areas of skin that were meant to contact the electrodes were carefully prepared with an abrasive cleaner and conductive gel. Additionally, video is recorded to ensure quality in segmenting the recorded data.

Making these adjustments allowed multiple clean datasets to be collected containing phrases, words and phonemes. The availability of clean datasets with many examples allowed Dr. Kang's Lab to create fine tuned, high accuracy machine learning models with increased accuracy above 90%.

**349 9:00 am 32**

### Mechanical properties of seawater glass fiber polymer reinforced concrete

**Timothy Park, civil engineering (U)**

For centuries, seawater has served as a substitute for freshwater in regions facing scarcity of the latter, like coastal areas. However, there have been concerns about the structural implications of using seawater in concrete. Multiple studies have shown that using seawater as a substitute in concrete

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can lead to significant structural problems, particularly corrosion within the concrete and its reinforcement, attributed to carbonation from the seawater mixture. We hypothesized that by replacing traditional steel reinforcement with Glass Fiber Reinforced Polymer (GFRP) can mitigate corrosion risks, preserving the integrity of sea concrete for more sustainable use. To investigate this hypothesis, we conduct a series of compression and indirect tension tests on small scaled seawater GFRP reinforced concrete columns at 3, 7, 28, and 90 days after pouring. The tested specimens include both seawater and freshwater mixed concrete, utilizing both steel and glass fiber polymer reinforcement for each sample. Particularly, we focus on the mechanical properties variation in seawater concrete with GFRP reinforcement versus traditional mechanical properties. Additionally, we analyzed characteristics of the water used in the experiments, specifically focusing on changes in characteristics such as sulfate content and pH to see its effects on the concrete. Based on the results obtained, it is suggested that the freshwater and steel reinforced concrete holds up slightly higher compressive stresses over time. These results also demonstrate the feasibility of GFRP reinforcement as a substitute for steel reinforcement in marine environments. Such materials can further enhance the utilization of sea concrete in a safer and sustainable way.

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**350 9:00 am 33**

**An Assessment of the Use of Multiple Human-Associated Fecal Source Tracking Markers to Monitor Fecal Pollution Moving Through Subsurface Soils**

**Tanaka-Herrera Charisma, Environmental Engineering (U)**

Limitations of traditional microbial water quality indicators hinder the identification of potential human sources of fecal pollution. The primary focus of this research was to assess two microbial markers: HF183, a DNA target from *Bacteroides doei* (a gut bacterium); and pepper mild mottle virus (PMMoV), a persistent pepper virus present in sewage. The ratio of HF183:PMMoV has been proposed to indicate the freshness of sewage contamination in water samples since HF183 is short-lived compared to PMMoV. We hypothesized that the ratio of HF183:PMMoV would also decrease as pollution moves through subsurface soils, helping identify underground sources of fecal pollution such as leaky sewer pipes and septic systems. We used soil column experiments to simulate the movement of sewage through subsurface soils, mirroring real-life scenarios. We first classified soils gathered from Alvarado Creek in San Diego. Specific gravity and permeability were measured to be 2.49 and 0.001 cm/s, respectively. A sieve analysis and the Atterberg Limit test were used to determine the soil type according to the Unified Soil Classification System (USCS) resulting in soil classified as poorly graded sand with silt. The soil was then packed into columns with depths ranging from 1 ft to 3 ft and a 1:1 mixture of sewage and creek water was pumped through the columns. HF183 and PMMoV were measured in 100 mL samples of water leaving the column and the log<sub>10</sub> change in the ratio was graphed. The soil column test resulted in a ratio of HF183:PMMoV that decreased by

approximately 0.5 log<sub>10</sub> units for each additional foot in the length of the soil column. Insights gained from this research suggest that sewage pollution originating from subsurface sources may exhibit a lower HF183:PMMoV ratio than direct sewage pollution. Therefore, we may discern if fecal pollution in a river has originated from a subsurface source by examining the HF183:PMMoV ratio. Such findings can lead to improvements in microbial source tracking methods, and potentially aid public agencies responsible for pollution management under the Clean Water Act.

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**351 9:00 am 34**

**Creating an App for Medical Data Collection**

**Hector Anaya, Bachelor of Science in Computer Science (U)**

Doctor's creating medication for diseases rely on data regarding the disease to understand it. We are working with doctors focusing on Raynaud's Syndrome to provide them and their patients with an app designed to procure as much data as possible from their patients with Raynaud's Syndrome.

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**352 9:00 am 35**

**Temporal Wastewater Degradation of TRP & CDOM**

**Selin Childs, Bachelor of Science in Environmental Engineering (U)**

Wastewater contamination of waterways occurs mainly from aging stormwater and sanitary sewer drains and groundwater infiltration from septic tanks. To prevent the spread of harmful contaminants to the aquatic environment, it is important to pinpoint sources for introduction of sewage to surface waters. Fluorescence Spectroscopy has proven effective in detecting these pollution sources, as it can be used to quickly identify compounds by their excitation and emission wavelengths. For example - tryptophan, an amino acid found in sewage, which can be identified by its fluorescence fingerprint, shares the same excitation and emission wavelengths as several other contaminants found in sewage, and creates a distinct peak during water analysis. Additionally, colored dissolved organic matter (CDOM) has a well-studied fluorescence profile and can also indicate the presence of sewage. Thus, this study quantified tryptophan and CDOM concentrations in raw wastewater using fluorescence spectroscopy to assess its accuracy for use in detecting wastewater contamination under different environmental conditions, including during direct exposure to sunlight and during various travel times in the subsurface.

The first stage of this experiment used real wastewater samples placed in a solar simulator (light conditions) and under a box (dark conditions) for 24 hours. Five-dimensional fluorescence spectra were acquired at times 0h, 1h, 4h, 10h, and 24h for both conditions. The preliminary results from this first stage demonstrated that tryptophan-like and CDOM fluorescence degrades following a double exponential curve under light conditions. Meanwhile, under dark conditions, fluorescence for neither tryptophan or CDOM degraded significantly. This experiment was replicated, but instead the wastewater was continuously stirred throughout the 24 hours to more accurately

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simulate water movement through pipes and waterways. Alongside that, measurements of fecal indicator bacteria were taken to more accurately track the degradation of the wastewater alongside the fluorescence data. Furthermore, the second stage of this experiment will study the transformation of fluorescence as the wastewater moves through the soil subsurface over time. Overall, this study is expected to identify limitations upon applying fluorescence spectroscopy for reliable and rapid tracing of wastewater infiltration into urban waterways.

## Session F-6

Physical and Mathematical Sciences

Friday, March 1, 2024 9:00 am

Montezuma Hall

**353 9:00 am 36**

### Characterization of 3D Printed Fiber-Reinforced Composites

**Ansel Flanagan, Aerospace Engineering (U)**

Advanced robotic manufacturing platforms can accelerate the production of fiber-reinforced composites with complex layup schedules and geometries at a much lower cost (engineering and manufacturing). Robotic 3D printing is in its infancy, casting doubts about the process-property performance of this new class of composite materials under different loading, operating, and environmental conditions. Therefore, the primary goal of this research is to elucidate the interrelationships between the processing parameters and the resulting mechanical behavior. The approach entails the fabrication of several panels with an adjusted layup schedule (i.e., fibers laid down at different orientations). The 3D panels are then cured using a modified procedure using a convection oven and an elongated curing cycle. Rectangular samples are extracted from printed panels, and the geometrical accuracy and mechanical properties are assessed. The primary printing metric of printed composite materials is the fiber volume fraction ratio, measured using thermogravimetric analysis. The print quality was quantified by submitting the samples to intensive examination for structural defects and geometrical intolerances. The mechanical properties were assessed by testing the samples under quasi-static flexural loading to report stiffness, strength, and failure mechanisms. The mechanical testing was augmented with digital image correlation (DIC) to report full strain fields and detect initiation and propagation of failure mechanisms. The results of this study define the manufacturing and design boundaries of this novel class of composite materials.

**354 9:00 am 37**

### Analysis of Grain Size and Organic Matter Content in the Benthic Zone of Tijuana River Estuary

**Callie Summerlin, Environmental sciences (U)**

The purpose of this project is to measure and compare the particle size and organic matter content of sediments in the

benthic zone at the mouth and outlet of the Tijuana River Estuary and use the data to better understand nearby turbidity hotspots. Sediment samples were cored in a northern tidal channel arm of the estuary and the outlet of the estuary then analyzed by using loss on ignition to determine organic content and sieves to determine grain size. Particles smaller than .0625 mm were analyzed using a particle size analyzer. To study the relationship between grain size and turbidity hotspots, areas of high turbidity were identified using satellite imagery and data from a remote-controlled boat system in the outlet of the estuary. Grain size was statistically different at the 5% level of significance from sites located at the tidal channel of the Tijuana River and the outlet. All samples from both locations had a D50 value classified in the category of medium sand except for one sample that was classified as fine sand based on the Wentworth (1922) grain size classification. These results differ from a study that was conducted in the southern arm of the Tijuana River Estuary where the majority of grain size was classified as very fine grained (Berry, 2019). The classification of coarser grain size in the majority of sediment samples within my study indicates that turbidity hotspots may be produced by medium sand particles rather than clay or silt. Organic matter content was low in all samples but highest in the tidal channel of the Tijuana River (2.1%). A previous study in the Tijuana River Estuary showed a higher organic content and that heavy metals are more commonly found in fine sized particles with high organic content (Weis et al., 2001). Turbidity hotspots during dry weather conditions appear not to be caused by localized deposits of fine sediment or organic material, but to resuspension of fine sand due to hydraulic conditions that favor resuspension. More information is needed on the bathymetry of the estuary to map shear stresses and material types that contribute to turbidity in the water column.

**355 9:00 am 38**

### Biological Evaluation and Chemical Synthesis of Carmaphycin “War-heads” as Potential Treatments Against *Trichomonas Vaginalis* and Various Cancers

**Brandon Ismael Gonzalez, Bachelor of science in Chemistry emphasis in Biochemistry (U)**

*Trichomonas vaginalis* is the causative agent of trichomoniasis, the most common, non-viral sexually transmitted disease, with 5- 7 million cases in the U.S. and >200 million in the world each year. In addition to infections of the urogenital tract, trichomoniasis increases the risk of adverse pregnancy outcomes, HIV transmission, and the incidence and severity of cervical and prostate cancers. Treatment of trichomoniasis is primarily with oral nitro drugs, but they can have moderate to severe adverse effects. Because of the prevalence of this parasite, the appearance of drug-resistant strains, and its association with multiple diseases, the development of new antimicrobials is an urgent need, particularly in women where infection can persist for months or even years.

The Carmaphycin A or B are powerful anticancer compounds isolated from

cyanobacteria located near the Caribbean island of Curacao. They were shown to have powerful cytotoxic properties against

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lung cancer cell lines (IC50 ~ 5 nM). Interestingly, Carmaphycin analogs show significantly reduced activity against lung cancer but demonstrate instead excellent IC50 levels against liver cancer, specifically the HepG2 cell line (IC50 of 62 pM). With epoxyketones as powerful “war-heads” structures it has been established these compounds act on a proteasome target for various cancer cell lines as well the *Trichomonas vaginalis*. A large number of synthetic epoxy ketones related Carmaphycins were prepared and screened against various cell lines. These cancer and parasitic data will be presented and discussed.

**356 9:00 am 39**

### Converting biomass-derived compounds to value-added products by electrochemical oxidation

**Claire Baeriswyl, Bachelor of Science in Chemistry (U)**

Human’s increasing energy consumption escalates the depletion of fossil fuels and stimulates a growing demand for sustainable energy sources. Hydrogen fuel is a promising renewable energy source that can be produced through an electrochemical water-splitting reaction. The water-splitting process occurs in two half-reactions: water reduction at the cathode, forming hydrogen gas (HER), and water oxidation at the anode to produce oxygen (OER). “Green” hydrogen as a fuel produced from water-splitting poses significantly less harm to the environment than fossil fuel combustion. However, water-splitting faces limitations due to the sluggish kinetics of OER. Fortunately, this limitation can be alleviated by replacing the OER with biomass oxidation. Raw biomass is processed at refineries to generate usable substrates like sugars. Compared to the direct water oxidation reaction, biomass oxidation requires much less energy input. These biomass-derived substrates allow for forming value-added products in addition to hydrogen fuel.

Herein, we identify that Cu-Ni foam can be an efficient electrocatalyst for converting biomass-derived compounds into value-added products. C5-C6-based biomass compounds (i.e., Sorbitol, Glucose, Xylose, and Fructose) were studied. So far, I have identified formic acid and acetic acid as main products through Nuclear Magnetic Resonance (NMR) post-electrolysis analysis. Further electrochemical testing will quantify the products, and evaluate electrocatalysts’ performance to inform on optimizing the biomass conversion. I plan to perform surface analysis on the Cu-Ni foam catalyst before and after biomass oxidation using Raman spectroscopy and X-ray photoelectron spectroscopy (XPS) to chemically characterize the catalyst change before and after the electrochemical conversion process.

**357 9:00 am 40**

### Investigating the effective temperature of red supergiants

**Beatriz Miranda Abreu, Bachelor of Sciences in Astronomy (U)**

Stars come in various different sizes and masses and there is a category of stars called red supergiants. They are massive in size and weight and they are also relatively cool compared to other stars. Although extensively studied, there is some needed

information about their evolution, radius and temperature that is hard to obtain. There are some tools that could help us better understand these characteristics about red supergiants and one of them is by studying a certain molecule present in their atmosphere. Red supergiants can have a unique feature of having molecules in their atmosphere in addition to other elements due to their cool atmosphere. The study of a molecule called titanium oxide has been proposed to yield a more accurate measurement of the effective temperature of these stars. More research on this molecule is needed to say with more certainty that it is correlated to effective temperature and this is what my research will be focused on. In particular, I am investigating the correlation between the effective temperature of red supergiants and the equivalent width of the 7054 titanium oxide band. Here I present preliminary results from this study.

## Session F-7

Health, Nutrition, and Clinical Sciences

Friday, March 1, 2024 9:00 am

Montezuma Hall

**358 9:00 am 41**

### Faith in Motion: Collaborative Strategies with Church Staff for Implementing Physical Activity Programs

**Carolina Costa, Bachelor of Arts in Psychology Neuroscience Emphasis (U)**

Background:

Research has emphasized the significance of faith-based leader support when implementing evidence-based physical activity (PA) interventions in churches. However, emerging research suggests that church staff may be key partners in implementing health programs than previously recognized. The present study explores the role church staff can play in implementing health programs and barriers they face in the implementation process.

Setting/Population:

Participants included church staff (n=12) and church leaders (n=11) at Latino-serving catholic churches (n=8) in San Diego County, California.

Methods:

We conducted semi-structured interviews with church staff and leaders. The updated Consolidated Framework for Implementation Research (CFIR) was used to inform the interview guide. CFIR domains assessed included: innovation, inner setting, and implementation processes. Interviews were audio recorded, transcribed, and analyzed using Rapid Qualitative methodology.

Preliminary Results:

Church staff are vital in supporting program activities by facilitating communication between church leaders, church members, granting access to church facilities, and coordinating church schedules. During the day-to-day operations of churches, staff are often responsible for supporting all ministries

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and church-related activities. In the interviews, church leaders and staff underscored the importance of maintaining continuous communication with the implementation team.

Conclusions:

The results of this study underscore the significance of partnering with church staff in the implementation of health programs within religious institutions to optimize the implementation process. Because staff's enthusiasm and willingness to support the implementation of health programs can vary across churches, working collaboratively to address their specific needs is essential. The findings address a gap in implementation research within church settings by identifying the contributions from church staff, offering valuable insights to inform implementation strategies for faith-based physical activity programs.

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**359 9:00 am 42**

### The Impact of Diet on Traumatic Brain Injury Responses of Adult Fruit Flies

**Robert Squier, Bachelor of Science in Microbiology (U)**

Long-term neural health requires the complex interplay between a wide range of factors. Our previous work has highlighted the versatility of *Drosophila melanogaster* models to explore genetic and environmental factors that promote or erode the long-term function of the adult CNS. Using both aging and traumatic brain injury (TBI) models we have identified autophagy pathway components (genetics) as well as dietary, probiotic and therapeutic treatments that promote healthy neural aging. In this study we examine the potential role that diet plays on adult fly responses following mild repetitive trauma (mTBI, 10x) exposure. We have shown an intermittent fasting (IF) regime promotes neural health as well as autophagic function in the aged fly nervous system. In this study, we will examine the impact that IF and exposure to high fructose corn syrup (HFCS) has on acute and long-term global trauma responses (mortality, longevity, inflammation profiles) and neural function (behaviors) following mTBI exposure. Fructose is a monosaccharide naturally found in fruits, honey, and sucrose (50:50 fructose, glucose). Consumption of HFCS has become a major concern in the USA, due to extensive corn production and commercialization of cheap HFCS into highly processed food. There is speculation that HFCS increases obesity, Type-II diabetes and other negative health outcomes compared to the consumption of sucrose. In this study, we will pre-treat male fruit fly cohorts (+400) on a) standard fly food; b) food containing 20% (w/v) HFCS; and c) standardized IF protocol for 10 days. Half of each cohort (~200 flies) will be mock-treated or exposed to standardized levels of trauma using our Bead Ruptor method (2.1 m/s, 10 bouts) and returned to their respective diets. The number of dead flies will be counted 3-times per week over the entire study and used to establish mortality indexes (1-D, 1-W, 2-W, 3-W) and lifespan profiles. Climbing behaviors or geotaxis responses (1-W, 2-W, 3-W post mTBI) will also be used to establish the relative impact of diets to modulate trauma responses using *Drosophila* as a high throughput in vivo model system of neural aging.

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**360 9:00 am 43**

### People's Produce Mobile Farmers' Market: Addressing Food Apartheid in Southeastern San Diego

**Andrea Meza, Bachelor of Science in Public Health (U)**

Historically, social injustice in San Diego has been most prevalent in the southeastern region, with lack of food security, or presence of food apartheid, being one of the most concerning consequences of social injustice experienced by community members. The People's Produce Mobile Farmers' Market (PPMFM) is a community-driven project, initiated in October 2022, that aims to fight food apartheid and advocate for health equity for all populations living in Southeastern San Diego (SESD). We aim to describe PPMFM, its activities, and its customer reach during the 2023 SDSU Summer Undergraduate Research Program period, from June 2023 to December 2023. The PPMFM is a mobile produce truck operated by the grassroots nonprofit, Project New Village, and provides access to affordable, fresh, organic, locally grown fruits and vegetables to underserved communities of SESD at various sites each week. Through a partnership between PPMFM and an SDSU nutrition Professor, SDSU students provide nutrition education sessions and materials and conduct surveys with customers, collecting sociodemographic, nutrition behavior, and health information. In June and again from October to December, customers participating in these activities received a \$10 coupon to use at the PPMFM. From June 2023 to December 2023, the PPMFM held 97 markets across 8 SESD community partner sites. Students offered nutrition education to customers on a variety of topics, including how to eat healthy on a budget and how to select, store, and prepare specific fruits and vegetables available at the PPMFM. In June and from October to December, a total of 894 and 930 customers, respectively, participated in nutrition education and completed surveys. Over the summer and fall semester 2023, the PPMFM provided access to fresh, local produce and nutrition education to many community members in SESD. By providing such essential services to the people of SESD, the PPMFM is beginning to address food apartheid to promote health equity.

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**361 9:00 am 44**

### Smoke Exposure in Various Public Locations

**Amelia Allison, Bachelor of Public Health (U)**

The presence of harmful chemicals in tobacco smoke poses serious risks, and the need for broad smoke-free laws is essential. The current City of San Diego policy requires outdoor dining venues established within the public right of way to be smoke and vape-free. However, the current San Diego City Policy fails to protect patrons and workers from secondhand (SHS) and thirdhand smoke (THS). The objective of our study was to evaluate tobacco-related pollutants in outdoor dining areas and hookah lounges in San Diego, CA. We utilized a cross-sectional approach, where we measured and compared THS/SHS levels in differing outdoor dining settings and indoor hookah bars. We collected surface wipe samples and air samples from 5 non-smoking and 5 smoking outdoor dining

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locations. We used the Atmotube PRO, a portable air monitor, to measure PM1, PM2.5, PM10, Temperature, Humidity, Atmospheric Pressure, and volatile organic compounds, and calculated an Air Quality Score (AQS), offering insight into air quality and cleanliness as well as the associated health risks. Data was organized and analyzed using SPSS software. Our results indicated significant differences in environmental factors, such as PM1, PM2.5, PM10, and VOC levels, across these settings. Notably, hookah venues exhibited higher exposures, and unexpected air quality issues were identified in some non-smoking locations. Our study emphasizes the importance of enforcing smoking regulations to address these air quality challenges in public dining areas, suggesting the need for further research to understand the scope and improve regulation and compliance.

### 362 9:00 am 45

#### Recovery of muscle torque after lengthening contraction injury in cigarette smoke-exposed mice

**Tyler McClure Kent, Bachelor of Science Kinesiology  
Emphasis in Pre Physical Therapy (U)**

To investigate the effects of short-term CS exposure on in vivo torque recovery of anterior crural muscles after lengthening contractions (LCP). Adult mice expressing tdTomato fluorescent protein in satellite cells (Pax7CreER-Ai9, 8 weeks old; n=3) were daily exposed to smoke from 10 cigarettes (1R6F), 5x per week for 8 weeks (CS group). Non-exposed mice were age-matched controls (VIV group, n=4). On week 6 of CS exposure, mice were treated with tamoxifen (2 mg/day, i.p.). On week 7, torque produced was measured on both legs, and one leg was subjected to LCP (400, 1,0000/sec for 150 contractions). On days 3 and 7 torque was measured on both legs. Tissues were collected on day 7 for ex-vivo extensor digitorum longus (EDL) contractility and for tibialis anterior (TA) histology. Maximum torque developed by the uninjured leg was not different between groups at any point ( $90 \pm 10$  vs  $90 \pm 10$  Nmm/kg for Pre-LCP;  $76 \pm 14$  vs  $109 \pm 7$  Nmm/kg day 3; and  $95 \pm 7$  vs  $99 \pm 1$  Nmm/kg day 7; VIV vs CS, respectively,  $P > 0.05$ ). In the LCP legs, in-vivo torque pre-LCP ( $101 \pm 3$  and  $106 \pm 14$  Nmm/kg) was decreased for both groups after LCP ( $35 \pm 3$  and  $30 \pm 7$  Nmm/kg). On day 3, torque was lower in the CS group vs VIV group ( $25 \pm 4$  vs  $60 \pm 13$  Nmm/kg,  $P < 0.05$ ). However, at day 7, torque was not different between groups ( $48 \pm 4$  Nmm/kg for VIV vs  $36 \pm 7$  Nmm/kg, for CS,  $P > 0.05$ ). Ex-vivo maximal force of EDL obtained at day 7 was not different between groups in uninjured legs ( $446 \pm 31$  vs  $456 \pm 11$  kPa, respectively,  $P > 0.05$ ) but was statistically smaller in the CS group from LCP legs ( $213 \pm 49$  vs  $345 \pm 38$  kPa, for CS vs VIV,  $P < 0.05$ ). **CONCLUSION:** Mice exposed to CS over 8 weeks showed a slower recovery of in-vivo torque after LCP compared to VIV mice.

### 363 9:00 am 46

#### Relationship between unintentional finger force drifts and surface texture

**Mia Naranjo, B.A. in Psychology, Emphasis in Neuroscience;  
B.S. in Kinesiology, Emphasis in Pre-Physical Therapy (U)**

Frictional forces between our fingertips and object surfaces allow us to hold objects in our hands, which is a significant component of many activities of daily living. The area of the fingertip that is in contact with a handheld object increases over time as dermal ridges of the fingerprints conform to the object's surface, which results in increased friction between the fingertips and the object. On the same timescale, force production by the fingers while grasping an object tends to decrease unintentionally and asymptotically. This project investigates whether unintentional force drifts in finger force production are related to increased dermal ridge contact of the fingertip. Drift in constant force production of the finger flexors is classically explained by a working memory deficit. Alternatively, force drift may be an adaptive process of the central nervous system to minimize energy expenditure as fingertip friction increases. Participants complete a series of sixty force production tests in which they are instructed to use their dominant index finger to press down on Plate 0 (low surface deformation) or 1 (high surface deformation, such that changes in dermal ridge conformity minimally affect fingertip friction). These plates are attached to a force sensor. For the first few seconds of each trial, participants receive visual feedback to ensure they produce 10 Newtons. They are instructed to continue pressing with the same amount of force until the end of the trial when they drag their finger along the surface. To discriminate between the competing classical and alternative hypotheses, quantitative analyses comparing the rate of force drift and frictional forces on Plate 0 and Plate 1 will be completed.

### 364 9:00 am 47

#### Bilingual elementary students' awareness and self-report of their language proficiency

**Viridiana Apodaca, Bachelor of Arts in Speech, Language, and  
Hearing Sciences (U)**

**Intro:** When studying bilinguals, it is important to gather information about their home and school language experiences and their proficiency in each language. Parents are often asked to provide information regarding the child's bilingual experience; however, response rates to parent questionnaires are often low, which limits our ability to know about children's home language use. We want to see if a language questionnaire that children respond to would correlate with their scores on direct assessments of Spanish and English language and literacy.

**Procedures:** The Houston Questionnaire (Houston-Q; Castilla-Earls et al., 2022) is a self-report questionnaire for children that provides information on their Spanish and English experience and proficiency. Assessment-2-Instruction (A2i) assessments are online adaptive tests that analyze language and literacy skills in Spanish and English. The 6 tests measure code-focused (decoding), meaning-focused (semantic), and reading comprehension abilities in each language. We gave 303 students (6 PreK, 6 Kindergarten, 99 1st grade, 125 2nd grade, and 67 3rd grade) the HoustonQ Questionnaire. Of these, 285 students enrolled in dual-language classrooms and 18 in English-only classrooms also took the A2i tests. The Houston-Q was administered one-on-one or in small groups with the

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support of a research assistant.

Results: Correlations among the Houston-Q responses related to English were significantly and positively correlated with the English decoding and reading comprehension scores (rs range .20-.23), but not the semantic assessment. The self-assessment of Spanish was related to performance on the Spanish semantic and reading comprehension measures (rs range .15-.16), but not the decoding assessment. Correlations for English variables were stronger among children in dual-language education, while correlations for Spanish variables were stronger among children in English-only education.

Conclusions: Overall, the student's self-report of their English and Spanish experience and proficiency correlates with the computerized assessment scores. However, these correlations are weak, suggesting that we are only capturing part of the variability in actual language skills via children's self-report. This demonstrates limited evidence of the validity of the students' responses to the Houston-Q for capturing children's language proficiency and experiences. Researchers may consider using Houston-Q to supplement other language proficiency measures.

## Session F-8

Behavioral and Social Sciences

Friday, March 1, 2024 9:00 am

Montezuma Hall

**365 9:00 am 48**

Sensitive early detection of chronic traumatic encephalopathy related biomarkers using nonlinear multi-photon laser wave-mixing spectroscopy

**Nino Shatirishvili, Chemistry (D)**

Reliable confirmation of Chronic Traumatic Encephalopathy (CTE) remains

challenging due to its resemblance to other neurological diseases and the post-mortem diagnosis requirement. This study presents an innovative approach employing absorption-based four-wave mixing spectroscopy to detect cerebrospinal fluid (CSF) and serum biomarkers associated with CTE, aiming to distinguish CTE from similar disorders accurately. Two research objectives were pursued. First, a custom-built capillary electrophoresis system integrated with four-wave mixing spectroscopy achieved sensitive biomarker detection and separation. Second, the study demonstrated four-wave mixing detection with micrometer-thin liquid CTE biomarker samples on surfaces. The wave-mixing signal is generated when the two input beams are mixed inside the analyte and it can be collected with virtually 100% efficiency and maximum signal-to-noise ratio. The signal has a quadratic dependence on analyte concentration, and hence, small changes can be monitored more effectively. Since wave-mixing probe volume is small (nanoliter to

picoliter), it is intrinsically suitable for microfluidics or capillary-based electrophoresis systems (e.g., 75  $\mu\text{m}$  i.d.

fused silica capillary). Different biomarkers can be immobilized on a custom 3D printed slide. Since wave mixing is an absorption-based method, both fluorophore and chromophore labels could be used, if desired. The integration of four-wave mixing spectroscopy with separation methods holds promise for early and reliable CTE diagnosis, potentially benefiting individuals in the early stages of the disorder.

**366 9:00 am 49**

Untangling Ancient Health: Comparative study of Dental and Skeletal Markers of Disease in Lower Río Verde Valley, Oaxaca, Mexico

**Zachery Clow, Masters of Arts in Anthropology (M)**

The bioarchaeology of stress and disease aims to examine the complex and interconnected relationships between health, diseases, culture, and the physical manifestations left behind on the skeleton from a biocultural perspective. This study focused on whether social and political disruptions resulting from the Classic Period collapse (ca. 700-900 CE) in the lower Río Verde Valley (LRVV) of Oaxaca, Mexico had any effect on disease processes on the human body as evaluated from a gross skeletal and dental analysis. This critical transition spanning the Late Classic (500 – 800 CE) to Early Postclassic (800 – 1100 CE) is hypothesized to have affected the health of individual's and populations. The sample used for this study comes from 53 skeletal remains spanning from the Late Classic to Early Postclassic periods at Río Viejo, Oaxaca, Mexico. Health is measured in this study from disease prevalence rates and complemented with the concept of frailty, which has traditionally been conceptualized in archaeological contexts as an individual's susceptibility or relative risk of death compared to other members of a population. This study tests the applicability of frailty on collections with poor preservation due to soil conditions and taphonomic processes. Expanding the definition of frailty to encompass a cumulative measure of health, made up of multiple disease markers, as an on-going and changing state in archaeological contexts. This reframing of health and frailty can be used to rethink individual's resilience to diseases encounters throughout life and ultimately our contemporary measurements of general 'health' in archaeological assemblages.

**367 9:00 am 50**

Investigating the Effects of Family Structure on Early Language Acquisition

**Noemi Garcia Rodriguez, Masters of Arts in Psychology (M)**

Early language acquisition is crucial to the development of cascading cognitive processes, such as literacy and numeracy skills (Duff, 2015; Purpura et al., 2015). Disentangling aspects of the environment that influence early language is important for equitable healthy development. Socioeconomic status (SES) is important for accessibility to resources and opportunities, which in turn influences cognitive development and early language skills (Brito & Noble, 2014; Lecheile et al., 2020; Klucznik & Mudiappa, 2019). Recent attention has turned to household density and adult-to-child ratio as indicators of SES

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(Poudel et al., 2023; Singh et al., 2023), however the literature is inconsistent with regard to the effect of these indicators on vocabulary. Poudel et al. (2023) found a medium effect of household density and a small effect of adult-to-child ratio on vocabulary size. In contrast, Havron et al. (2022) found no effect of household size and a small effect of number of adults in the home. We explore relations between household size and pandemic disruption, and between household size, adult-to-child ratio, and vocabulary in children.

Our preliminary sample includes 39 children (Mage = 26.87 mos, range = 19 to 39, 19F, 30 English monolingual, 9 Spanish-English bilingual). Parents completed a modified COVID-19 Family Stressor Scale (Prime et al., 2021) to assess the magnitude and duration of pandemic disruptions in income, family relations, anxiety, and childcare. Conceptual vocabulary was measured using the web-based Computerized Comprehension Task in English and Spanish (Web-CCT; Friend et al., 2023), the MCDI and IDHC (Maldonado, et al., 2003; Marchman et al., 2023), and the ROWPVT or ROWPVT-SBE (Brownell, 2012; Martin & Brownell, 2011). Partial correlations controlling for age were calculated for relations between household size, pandemic disruption, and vocabulary (a factor derived from raw scores on the vocabulary measures). Household size correlated positively with disruption ( $r_{33} = .353$ ,  $p = .04$ ) and negatively with vocabulary ( $r_{36} = -.395$ ,  $p = .01$ ), consistent with Poudel et al. (2023). Contrasting with both Poudel et al. (2023) and Havron et al. (2022), adult-to-child ratio was uncorrelated with vocabulary size ( $r_{36} = .067$ ,  $p = .69$ ).

### 368 9:00 am 51

#### Investigating the Influence of Cardiovascular Risk Factors on White Matter Atrophy in the Parahippocampal Gyrus and Entorhinal Cortex

**Hector Reyes, Masters of Arts in Psychology (M)**

Significant evidence suggests impairment in the entorhinal region in cases of Alzheimer's Disease (AD) (Braak & Braak, 1992). The loss of structural integrity in the white matter areas of the brain can be a consequence of vascular damage and development of dementia, suggesting a link between these conditions (Appelman et al., 2009). We explore the relationship between cardiovascular risk factors (history of smoking, cholesterol, high blood pressure, and statin use) and white matter atrophy in the parahippocampal gyrus (PG) and entorhinal cortex (EC), areas that are critically damaged in AD (Jacobs et al., 2015; Mizutani & Kasahara, 1997; van Hoesen et al., 1991). This study sought to test whether relationships exist between white matter volume of the parahippocampal gyrus (PG) and the entorhinal cortex (EC) and interactions between education, smoking history, and cholesterol history. The volumes of the left and right PG and EC from MRI structural imaging (3T, T1-weighted) in 46 participants (26 female, 20 male) were averaged and analyzed using multiple linear regression analyses, with age, intracranial volume, and sex, as well education x smoking history and education x cholesterol history interaction terms as predictors. Significant interactions between education and smoking history were observed for the PG ( $p = .021$ ) and the EC ( $p = .009$ ), as well as between

education and cholesterol history for the EC ( $p = .029$ ). These findings highlight the importance of the heart-brain link and the important connections between dementia and cardiac disease. This exploratory analysis suggests the importance of further investigation of other possible cardiovascular risk factors and their relationship to white matter atrophy in other brain areas impacted by Alzheimer's Disease.

Supported by NIH grant # R01AG062006 from the National Institute on Aging to CM.

### 369 9:00 am 52

#### Supporting Emergent Multilingual Learners' Informal Science Education Experience

**Rose Anh Do, M.A. Education - Dual Language & English Learner Education (Outside Specialization) (M)**

With the increasing diversity of students represented in the United States and new scientific problems unfolding worldwide, there is a need for accessible science programs to foster young scientific minds. This qualitative mixed-methods study strived to investigate the complex challenges that informal science educators face in serving emergent multilingual

students and unveil the variety of teaching tools and practices used to support these students. An online survey alongside semi-structured interviews were evaluated with a general inductive approach in order to assess the current needs and practices of informal science educators at a variety of organizations. Findings so far (research is still ongoing) reveal that participants request additional training, translated materials, and information about students to serve emergent multilingual learners better. Suggestions for research and practice will be shared.

### 370 9:00 am 53

#### "My Barber is Like a Therapist": The Influence of Trauma-Informed Advocacy on Psychological Openness and Help-Seeking Behaviors Among African American Males During a Barber Visit

**John William Edwards, III, Masters of Social Work (M)**

Negative beliefs related to seeking help has adverse effects on Black men ages 18 – 35.

Specifically, stigma has been linked to unnecessary disability, substance abuse, domestic

violence, unemployment, homelessness, incarceration, and suicide in this population. These

circumstances become amplified when men do not have a way to decompress and communicate their feelings. Conversely, prioritizing self-care, which can be something as simple as getting a haircut when low self-esteem is detected, can encourage men to engage in meaningful conversation, thus reducing the fear of vulnerability. This study aims to investigate whether trauma-informed advocacy (i.e., advocating for psychological openness, providing mental health resources) with a strength-based approach during a haircut provided by a trauma-informed barber has an influence on help-seeking

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behaviors and general health outcomes (self-esteem, anxiety symptoms, depressive symptoms). This study will employ a mixed methods approach, including qualitatively assessing the reactions and responses of African American males to a haircut and quantitatively measuring outcomes through a survey. It's predicted that Black men who receive a haircut and engage in meaningful conversation that supports their individual needs may develop a healthy relationship with talking about their mental health.

**371 9:00 am 54**

### Transient and Continuous Neural Indices of Attention Selection and Suppression in Anxiety

**Ryan Shriver, MA in Psychology (M)**

At every moment, we are surrounded by numerous stimuli competing for limited cognitive resources. Attentional control, the ability to focus on stimuli relevant to our current goals and avoid distraction by irrelevant items, is pertinent to cognitive functioning. Attentional control has been shown to consist of two separate but related processes: (1) attentional selection of relevant stimuli, and (2) attentional suppression of irrelevant stimuli. These processes unfold within a few hundred milliseconds to jointly determine which stimuli receive additional cognitive resources, influencing an individual's behavior and actions. Previous research from our laboratory and others has shown that these two aspects of attentional control may independently relate to anxiety (Kappenman et al., 2021), indicating that the ability to separately measure and characterize such attentional mechanisms may be key to understanding individual differences in psychopathology. Previous research has utilized the millisecond-level temporal resolution afforded by electroencephalogram (EEG) recordings to measure these rapid processes of attention. Specifically, event-related potentials (ERPs) have been identified that separately index attentional selection using the N2pc and attentional suppression using the distractor positivity (PD). Other EEG studies have separated attentional selection and suppression by examining oscillatory steady-state visual evoked potentials (SSVEPs) that occur in response to attended and ignored stimuli flickering at a specific frequency. The goal of the present study is to simultaneously investigate both transient ERP (N2pc & PD) and oscillatory SSVEP measures of attentional selection and suppression to determine whether these two EEG measures of attention index the same or different aspects of the attentional control process. Participants completed a visual search task, in which they responded to a target stimulus (brown circle) flickering at 24 Hz while ignoring a salient distractor (green or orange circle) flickering at 20 Hz. This novel task design allowed us to isolate both ERP and SSVEP neural responses to target and distractor stimuli to determine the relationship among these measures of attention. Preliminary results showing the time course and magnitude of ERP and SSVEP responses will be presented. These results will further our understanding of the unique aspects of attentional control in relation to healthy and psychopathological cognitive function.

**372 9:00 am 55**

### The Control Conundrum: Unpacking the Relationship between Personality Traits and Policing Effectiveness

**Hannah Valley, Masters of Science in Industrial-Organizational Psychology (M)**

My study aims to investigate how the Big Five personality dimensions and the

subdimension of controlling relate to the performance dimensions of controlling suspects and arrests among police officers. In addition, this study will investigate whether the gender of the officers moderates this relationship. I will use a moderated multiple regression analysis with a controlling personality trait as the predictor variable, the performance dimensions of controlling suspects and arrests as the outcome variables, and the gender of police officers as the moderator variable. The findings of this study will offer valuable insights into the influence of personality traits on police performance, and contribute to enhancements in the selection and training processes within law enforcement.

## Session F-9

Biological and Agricultural Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**373 9:00 am 56**

### Catalytic dependence on K72 electrostatic contribution in isocitrate dehydrogenase 1

**Brittany Conley, JDP/PhD Biochemistry (D)**

Human isocitrate dehydrogenase 1 (IDH1) is responsible for the NADP<sup>+</sup>-dependent conversion of isocitrate (ICT) to alpha-ketoglutarate (KG) in the cytoplasm and peroxisomes. The products of the IDH1 enzymatic reaction fuel many biological processes, and mutations are associated with cancers such as acute myeloid leukemia (AML) and glioblastoma. Although there have been many investigations involving IDH1 and cancer-related mutations, the catalytic residues involved in the mechanism remain under debate. Structural analysis and preliminary in vitro kinetic assays show a key residue K72 may provide the required hydrogen bond that anchors the cofactor in place for catalysis to occur. Previous studies have pointed to a similar structurally analogous residue in *E. coli* IDH (K100) that was necessary for catalytic function. After assessing the similar chemistry and physical position in human IDH1, I performed site-directed mutagenesis first modeling a mutation at this position using PyMol to predict the structural change. Mutating the lysine to methionine caused a significant increase in distance between the NADP<sup>+</sup> cofactor and the new methionine residue. Next, I performed site-directed mutagenesis followed by heterologous expression to obtain the purified human IDH1 enzyme with the K72M mutation. By titrating in the isocitrate substrate in steady-state kinetics

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experiments and measuring the conversion of NADP<sup>+</sup> to NADPH spectrophotometrically, I concluded that this mutation causes catastrophic disruption of enzymatic activity. I predict that the structural and electrochemical changes caused by this mutation cause the charge-destabilization preventing the necessary hydride transfer for catalysis. Determining the charge-stabilizing residues required for the chemistry of catalysis expands our understanding of the IDH1 mechanism and helps assess the disruption in enzymatic function caused by mutations.

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**374 9:00 am 57**

**Hunting for genomic fossils: Inferring the characteristics of ancient polyploidization events from modern plant genomes**

**Tamsen Dunn, PhD in Evolutionary Biology (D)**

All modern diploid flowering plants are ancestral polyploids. Multiple rounds of whole genome duplications (WGD) have occurred throughout angiosperm evolution, and ancient WGD events tend to cluster in time across lineages during times of abrupt environmental fluctuations. The majority of sequenced plant genomes appear to have evolved from allopolyploids (hybrids with multiple subgenomes derived from different species), while only a few genera are ancient autopolyploids (multiple subgenomes derived from the same species). Ancient WGDs are commonly detected in a modern genome by analyzing the levels of divergence between pairs of duplicate genes. Divergence between gene pairs is quantified as the average number of synonymous substitutions per site (Ks) between the two genes. Since Ks is a proxy for time passed, modes in the histogram of these data indicate a spike in contemporaneous gene duplication. Thus WGDs may be detected by fitting mixture models to identify peaks in Ks distributions. However, there are several limitations to this technique, one of which is that the Ks peak gives the divergence time between the duplicated subgenomes, not the actual time the subgenomes came together into one novel species. For autopolyploids, the divergence time between the duplicated subgenomes is equivalent to the time of whole genome duplication. However, for allopolyploids, the divergence time and the whole genome duplication time may differ by several million years. Furthermore, allo and autopolyploids follow distinct molecular evolutionary trajectories. Thus surveys which seek to generalize the consequences of polyploidy must appropriately take into account the time and mode of speciation. To address this concern, I propose and test a novel, scalable analysis method to determine the mode of ancient speciation from the shape of the Ks histogram of a modern genome. Preliminary work so far has demonstrated that our prototype method provides a better fit to Ks curves from the 1000 plant transcriptome dataset as compared with previous methods, and works well for both allo and autopolyploid-derived species.

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**375 9:00 am 58**

**Development of in vitro Raf activation assays on supported lipid bilayers**

**Alexia Morales, Masters of Science in Chemistry (M)**

Cell signaling involves highly regulated multi-step pathways that relay signals to the nucleus for important processes such as cell growth and apoptosis. One such pathway, the mitogen-activated protein kinase (MAPK), is commonly dysregulated in a wide variety of cancers, including due to mutations in the membrane-associating GTPase RAS and its effector RAF kinase. Raf kinases reside in the cytoplasm in an inactive, autoinhibited state, and upon recruitment to the membrane via GTPase RAS, these autoinhibitory interactions are released. RAF activation involves complex, multi-step processes, including protein binding, lipid interactions, rearrangements of modular domains, phosphorylation, dimer formation, and allosteric effects. Membrane environments are thought to play a critical role in regulating these mechanisms, however, many aspects remain speculative, primarily due to the limited capability of classical biochemical methods to study dynamics and chemical reactions occurring at membranes. This study outlines our efforts to develop in vitro assays for studying the activation of the Raf signaling complex at membrane surfaces using supported lipid bilayers (SLBs). SLBs efficiently mimic the environment of the plasma membrane, allowing for quantitative analysis of protein function and structure through time-resolved spectroscopy and microscopy. As a first step, BRAF kinase was expressed in mammalian cells using lentiviral transduction. Cells expressing BRAF were isolated with antibiotic selection and validated with fluorescence imaging of live cells. To detect our specific protein of interest from the selected cells, we performed a Western blot analysis using a BRAF-specific antibody. From this, we will be able to purify autoinhibited BRAF kinases complexed with 14-3-3 and MEK1. In the future, the purified RAF complex will be utilized to investigate conformational dynamics, SHOC2-PP1-mediated phosphorylation mechanisms, and the atomic structure of the active Raf-Ras complex at membranes.

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**376 9:00 am 59**

**Effects of trichloroethylene metabolite S-(1,2-dichlorovinyl)-L-cysteine on extravillous trophoblast viability and invasion capacity under hypoxic and normoxic conditions**

**Frances Stein, Masters of Science in Environmental Health (M)**

Trichloroethylene (TCE) is an industrial degreasing solvent that persists in the environment via soil and groundwater and poses a threat to human health. Exposures to trichloroethylene and its metabolites, including S-(1,2-dichlorovinyl)-L-cysteine (DCVC), are associated with increased risk of adverse birth outcomes and placental dysfunction. Decreases in extravillous trophoblast invasion capacity and cytotoxicity are defining pathological characteristics of several adverse birth outcomes linked to placental abnormalities. The effects of DCVC exposure on viability and invasion under normoxic conditions, in addition to hypoxic conditions similar to those that occur in the first trimester of pregnancy, were evaluated and compared. To simulate hypoxic conditions, all hypoxia experiments were performed in a hypoxic chamber (STEMCELL Technologies) purged to 2% O<sub>2</sub>, monitored by an O<sub>2</sub> meter, and placed in

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an 37 °C incubator with 5% CO<sub>2</sub>. All non-hypoxia experiments were performed in a standard 37 °C incubator with 5% CO<sub>2</sub>. First-trimester human extravillous trophoblast cells, HTR-8/SVneo, were exposed in vitro to 0 (control) 5, 10, and 20 μM DCVC for 6 h and 24 h before measuring viability. Viability was measured using the MultiTox-Glo Multiplex Cytotoxicity Assay, quantified by plate reader. HTR-8/SVneo cells were exposed in vitro to 10 and 20 μM DCVC for 24 h before measuring invasion capacity. Invasion capacity was measured using transwell chamber inserts coated in Matrigel, mounted on microscope slides prepared with DAPI Fluoromount-G and examined under an EVOS M5000 microscope.

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### 377 9:00 am 60

#### A single-molecule recruitment rate of Raf on Ras-membranes

**Kesaria Tevdorashvili, Masters in Chemistry (M)**

Understanding the structure and dynamics of recruitment complexes at the cellular membrane holds critical significance in fundamental biology and biomedical applications. RAF kinases known as extensively studied proteins have profound implications in cancer. Despite the extensive study of autoinhibited RAF complexes' atomic structure, a void exists in understanding how specific interaction between RAS and RBD is modulated at membrane surfaces. To bridge this gap, we employed a Total Internal Reflection Fluorescence Microscope (TIRFM) technique. Our approach involved measuring RAS binding domain (RBD) recruitment binding rates on RAS-functionalized supported lipid bilayers, mimicking the membrane environment. To minimize perturbation of RAF-RAS interaction, we utilized site-specific labeling of a small inorganic dye. Quantifying RBD binding rates at varying RAS densities, we observed a significant decline on our calibration curve after 100 μm<sup>-2</sup>. This intriguing finding points towards potential RAS-RAS interactions at high densities, suggesting the possibility of RAS dimerization on the membrane. Contrary to the canonical notion in the field that Ras dimers promote Raf activation, our preliminary data proposes a novel hypothesis – Ras dimerization plays an inhibitory role rather than an activating one in regulating Ras and Raf interactions. This unexpected observation challenges the prevailing consensus, highlighting the complexity of molecular dynamics at the cellular membrane. This nuanced understanding not only enriches our comprehension of cellular behavior but also opens new avenues for innovative therapeutic strategies targeting dysregulated cell growth.

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### 378 9:00 am 61

#### Design and implementation of a photobioreactor for the cultivation of microalgae results in increased growth rates and productivities

**Salatiel Garcia Nava, Mechatronics (M)**

Microalgal cultivation is a promising technology for the capture of CO<sub>2</sub> in a sustainable framework. The growth rate of microalgae depends on suitable cultivation conditions that can potentially result in the successful generation of

commodities and high-value products at industrial scale. The highest microalgal growth rates are usually achieved in photobioreactors. Thus, for this project a multidisciplinary team of researchers, including biotechnology, chemical, and mechatronic engineers worked together on the design and construction of a loop air-lift photobioreactor. An acrylic column with a coaxial section with internal diameter of 12.7 cm and a height of 110 cm with a diameter of 20 cm was the body of the 5 L photobioreactor. The gas phase was distributed from the bottom through a sparger.

Additionally, the photobioreactor accounted for an external artificial illumination system that used a controller for high intensity and broad spectrum color LEDs. The pH was measured with a digital sensor and a fluorescence sensor was used to determine the dissolved oxygen concentration. The CO<sub>2</sub> in the gas phase was measured with a high sensitivity infrared sensor. The signals of the sensors were continuously acquired and processed on-line using a Raspberry development board programmed in Python.

Using the bioreactor we performed analysis of dynamic responses of growth and production and consumption rates of oxygen and CO<sub>2</sub>, respectively. The effect of light step-changes on the photosynthetic activity indicated pseudo-steady states in the oxygen concentration indicating a short-term photosynthetic acclimation for the generation of pigments and lipids.

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### 379 9:00 am 62

#### Investigating DNA Modifications That Determine the Host Range of Achromobacter Bacteriophages

**Yasaman Farokhi Soofi, Master of Science in Chemistry and Biochemistry (M)**

Bacteriophages are the most abundant biological entity in the biosphere. Phages have an immense genetic diversity and different lifestyle strategies, and have a major influence on the composition of the bacterial communities. The constant war between phages and their hosts is often referred to as the oldest 'arms race.' On one side, bacteria have developed strategies to resist infection by phages. The oldest and best known is the use of restriction endonucleases (REs) while protecting their own DNA by expressing modifying enzymes. Phages have evolved countermeasures to circumvent the bacterial antiphage defense systems; these include modifying their own nucleotides to block the host's restriction enzymes. While identifying phages to treat a multidrug resistant bacterial infection, we found that some phages, for example phiAxy18, can replicate and kill several strains of Achromobacter xylooxidans (CF116 and BCH1), while phiAxy10 can only kill one of these bacteria, BCH1. One possibility is that the CF116 strain is resistant to phiAxy10 because it lacks a receptor for the phage. An alternate possibility is that the CF116 strain can protect itself from phiAxy10 but not from phiAxy18, whereas the BCH1 strain cannot protect itself from either phage. We are characterizing phage DNA modifications to understand how these may determine the host range of Achromobacter phages.

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**380 9:00 am 63****The role of obese preadipocytes in the ovarian cancer tumor microenvironment****Sofia Howe, Cell and Molecular Biology (M)**

Ovarian cancer is the most lethal gynecologic malignancy in the United States and is attributed to over 70% of advanced stage relapse, resulting in high morbidity and mortality. It is well known that ovarian cancer initially metastasizes to the omentum, which is an abdominal fatty tissue sheet composed of mature adipocytes, and stromal cells such as preadipocytes, fibroblasts and immune cells. Recent studies indicate preadipocytes enhance tumor initiation capacity of ovarian cancer in vivo and increased viability and proliferation in in vitro co-culture experiments compared to their mature counterparts. Moreover, obesity is considered a non-infectious pandemic that can potentially exacerbate a patient's survival with ovarian cancer. Preadipocytes are an active component of visceral fat which is correlated with obesity. We hypothesize that obese preadipocytes contribute to ovarian cancer progression and drug resistance through alternative NF- $\kappa$ B signaling and IGF enrichment. To evaluate this hypothesis, we will use 3T3-L1 preadipocyte cells, differentiate them to mature adipocytes, and coculture them with ovarian cancer to assess changes in Rel B activation, or dedifferentiation of adipocytes to their precursor state. We will also carry out a subcutaneous mouse model, assessing adipokine secretion and IGF changes within tumors of obese or normal BMI preadipocytes. Ultimately, we hope to highlight the role of preadipocytes in the ovarian cancer tumor microenvironment and uncover signaling factors that may enhance ovarian cancer. Understanding these processes under obese conditions will enable the design of more effective therapies for treating ovarian cancer.

**Session F-10**

Engineering and Computer Science

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**381 9:00 am 64****Surface and subsurface flows in different wildfire-affected landscapes****Ramya Chandrasekaran, Graduate/Civil Engineering (M)**

There is a need to understand the impact of wildfire on surface-groundwater interactions. This research will build on previous studies investigating changes in runoff and infiltration on wildfire affected soils and add to the literature of post-fire vadose zone processes. Four experimental hill slopes will be used to simulate different post-fire environmental conditions for: 1) heavily-trafficked roadways, 2) green spaces in suburban communities, 3) forested areas resembling the Pacific Northwest, and 4) chaparral representing Mediterranean systems in California. Two control hill slopes will be monitored and provide non-wildfire conditions, one with vegetation and the other with barren soil. Rainfall will be simulated to induce

surface and subsurface hydrologic processes. We will measure the volume of surface runoff, infiltration rates, soil water volume content, and saturated hydraulic conductivity for each hill slope condition. This goals of this poster presentation are to present a 1) literature review of studies on hydrological processes in wildfire-affected environments towards the development of a workflow to evaluate the impacts of different landscape conditions on surface and subsurface flow and 2) a prototype of the hillslope experiments.

**382 9:00 am 65****Development and Validation of an Apparatus to Improve the Efficiency of NASA-STD-6001B Test 1 Flammability Test****Jarred Druzynski, Masters of Science in Mechanical Engineering (M)**

In this project I developed and validated an apparatus that emulates NASA-STD-6001B Test 1 Flammability tests. Standard Test 1 tests burn a vertically mounted sample in a large, quiescent chamber, noting the burn rate, flame behavior, and whether the sample burns more than 6 inches. This apparatus is able to test material flammability in an upward configuration at varying pressures and oxygen concentrations, and proves to be more repeatable and quicker to run than NASA's Test 1 chamber. The testing apparatus' size necessitated airflow during the test, which goes against Test 1's standard procedures. Ansys Fluent simulations show the magnitude of the forced flow over the sample is magnitudes less than the flow due to natural convection from the sample burning. Through experimentation, it is shown that at certain flow rates the maximum oxygen concentration (MOC) that cotton will not burn at matches that measured in NASA's quiescent tests. Data from NASA's MATPIS material database on cotton's flame spread rate at different concentrations has too much error to be of use, but the flame spread rate data produced from this apparatus' tests is cleaner and is nearly linearly dependent on oxygen concentration and inlet velocity.

**383 9:00 am 66****Characteristics of a Two-Dimensional Turbulent Wall Jet over a Convex Surface of a Constant Radius****Bryan Tan, Master of Science in Mechanical Engineering (M)**

In concentrating solar power systems, sunlight is focused onto receivers via fields of heliostats. The Combustion and Solar Energy Laboratory designed a quarter-scale version of such a receiver to carry the energy collected from solar radiation to be used in a heat engine. A quartz window allows solar radiation to effectively heat the working fluid in the receiver while containing the fluid. However, such a receiver may experience temperatures over 1000 K, at which devitrification of quartz may occur—compromising its optical performance and structural integrity—and thus cooling of the window using pulsed wall jets is proposed. Expanding upon previous work in the laboratory, a turbulent wall jet over a two-dimensional curved surface matching the radius of the dome window is experimentally and computationally analyzed. An apparatus

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is constructed to allow for wall jets to be pulsed along the surface from each side. Velocity profiles of the wall jets are collected using a single-sensor hot-wire probe for initial jet velocities ranging from 10 m/s to 30 m/s, and for various locations along the jet. Surface oil flow visualization is used to better understand the behavior of the wall jet, including its two-dimensionality and separation. The two-dimensional turbulent wall jet is simulated in Ansys Fluent using variations of  $k$ - and  $k$ - models, and the velocity results are compared with the experiments. Determining the separation of the flow, if any, is important as the surface past the separation point may not be cooled. Preliminary transient simulations of pulsed wall jets from both sides are also performed. While the simulation indicates separation only near the farthest point from the jet inlet due to walls, separation occurred as early as  $90^\circ$  from the inlet in the experiments. Furthermore, apparatus produced wall jets that were not two-dimensional, as a much higher velocity was observed near the centerline of the surface compared to the edges.

**384 9:00 am 67**

### Modeling Sediment Transport and Sedimentation in the Lower Alvarado Creek Watershed

**Patrick Fassell, M.S. in Civil Engineering (M)**

Sedimentation and sediment transport in streams are important river processes that impact riparian vegetation and aquatic habitats. Anthropogenic activities can alter these hydrologic and geomorphic processes; thus there is a need to understand altered sedimentation and transport dynamics to guide habitat restoration and preservation efforts in urban riverine systems. The goal of this study is to utilize the Hydraulic Engineering Center-River Analysis System (HEC-RAS) to model the sediment transport and sediment load in the lower Del Cerro reach of Alvarado Creek, an urban stream in San Diego, California. Field data, streamflow, sediment size distribution, and channel topography, were utilized to parameterize HEC-RAS. We modeled sedimentation and sediment transport for the 2022 water year (1 October 2021 to 30 September 2022). The baseline hydraulics were first simulated using streamflow data from a post-restoration storm and compared against known flow depth to calibrate and validate the model parameters from previous work. A sediment model for the 2022 water year overall and for a 100-year storm simulated based off of 2022 water year hydro-geomorphological conditions and the in-channel grain size distribution data collected in the field. It was calibrated to channel cross sections, where the dimensions are a proxy of the overall bottom depth of the streambed. In a broader context, this work serves to establish a predictive model of how the hydro-geomorphology of the Del Cerro reach of Alvarado Creek may change with time post-restoration.

**385 9:00 am 68**

### The Impact of Structure Loss on Water Quality and Supply After Wildfires in California

**Savannah Regan, Masters of Science Water Resources Engineering (M)**

Wildfires in California can have chronic impacts on ecosystems and watersheds, proliferating the risk of disruption to urban water supplies, making monitoring, and preparing for water quality post-wildfire vital to protect environmental and public health. Water quality is compromised from surface runoff, which is more apparent in urbanized areas, and erosion, which leads to the diversion of pollutants post-wildfire into waterbodies and drinking water infrastructure. There is research on post-wildfire water quality, however these studies have focused on nutrients, suspended solids, and metal loadings, rather than contaminants that are byproducts of burned urban materials, such as volatile organic compounds (VOCs) or the chemical group known as per- and polyfluoroalkyl substances (PFAS). Research on PFAS continues to identify health risks, and in response, the United States Environmental Protection Agency has proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS constituents, making concentrations a primary concern in drinking water. The goal of this work is to identify a range of conditions for five California Wildfires: Camp, Woosley, Carr, Tubbs, and Nuns fires, to statistically model wildfire-watershed risk hotspots. We will utilize spatial information, structure loss, and watershed characteristics with pre- and post-fire water quality data. Specifically, this work will 1) develop empirical relations for post-fire contaminants and 2) identify opportunities to collect more data to bridge gaps in data, guide strategic water quality sampling, and further modeling and prediction tools that can be used by communities, post-fire watershed emergency response teams, water managers, and other decision makers to identify watershed and water quality hazards for a range of conditions. The long-term goal of this work is to understand the movement of pollutants into urban infrastructure or waterways in urban areas, to develop an understanding of potential risk to downstream burned areas in California.

## Session F-11

Physical and Mathematical Sciences

**Friday, March 1, 2024 9:00 am**

Montezuma Hall

**386 9:00 am 69**

### Modeling Water Quality Dynamics in the Tijuana Estuary: A CE-QUAL-W2 Approach

**Coty Huneau, MS Watershed Science (M)**

This study introduces a cutting-edge approach to estuarine modeling, integrating high-resolution bathymetry data into a specialized CE-QUAL-W2 model tailored to the intricacies of the Tijuana Estuary. Bathymetry assumes a pivotal role in refining the model's accuracy, delivering a nuanced portrayal of water depths, flow velocities, and sediment transport pathways.

Commencing with the assimilation of detailed bathymetric data, essential for capturing the topographical complexities of the Tijuana Estuary, the research seamlessly incorporates this information into the CE-QUAL-W2 model. This integration significantly enhances spatial resolution and simulation fidelity,

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enabling the model to proficiently capture the subtle dynamics of the estuarine environment.

Beyond traditional inputs, the inclusion of bathymetry contributes to a comprehensive representation of the estuarine system. The model excels in simulating tidal interactions, hydrodynamic processes, and sediment transport, presenting a powerful tool for unraveling the intricate interplay between physical and environmental factors within the Tijuana Estuary.

Moreover, the study explores the far-reaching implications of bathymetric data on ecosystem responses, particularly in relation to habitat distribution, water quality, and overall ecological health. The model, enriched by spatial variability afforded by bathymetry, emerges as a valuable asset for decision-makers and environmental practitioners addressing challenges related to land use, climate change, and anthropogenic impacts on the estuarine ecosystem.

This research represents a significant advancement in estuarine modeling methodologies, emphasizing the crucial role of bathymetry data integration. The resulting model not only deepens scientific understanding but also serves as a potent instrument for guiding sustainable management and conservation efforts in the ecologically vital Tijuana Estuary.

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### 387 9:00 am 70

#### The Direct Detection of Gas Inflow onto Galaxies between $z \sim 0.65$ and $z \sim 2.35$

**Andrew Pitts, Masters of Science in Astronomy (M)**

Detecting gas accretion onto galaxies from the circumgalactic medium (CGM) is fundamental to understanding the processes which drive star formation and the dynamics of galaxies. However, the direct observation of gas inflow is difficult due to the complexity of gas kinematics both within the CGM and the interstellar medium (ISM). We use spatially-resolved spectroscopic observations from the Multi Unit Spectroscopic Explorer (MUSE) on the Very Large Telescope (VLT) to search for galactic scale gas inflow within a sample of 119 galaxies. We trace the kinematics of cool ( $T \leq 10000$  K), photoionized gas in the CGM by modeling the Mg II  $\lambda\lambda 2796, 2803$  absorption features in each galaxy spectrum, and measure flow velocity as the Doppler shift of Mg II. Our measured distribution of velocities shows possible inflow detections within our sample. We aim to compare these results with star formation rate (SFR) and stellar mass measurements in order to explore the connection between flow velocity and galaxy evolution.

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### 388 9:00 am 71

#### Constraining Properties of the Cool Disk-Halo Interface using CloudFlex

**Nissia Indrajaja, Masters of Science in Astronomy (M)**

Theoretical models predict that a galaxy's star formation history is intimately connected to the inflow and outflow of gas in the disk-halo interface that surrounds it. The interface is thought to contain cool material ( $10^4$  K) that coexists with and moves through hot material ( $10^6$  K). While the physics of this coexistence aren't well understood, hydrodynamical

cloud-crushing simulations have offered possible explanations for how the cool material is able to coexist in the hot medium and provide predictions for the cloud sizes, masses, and velocities of these cool structures. Meanwhile, advancements in observational studies have allowed for theoretical predictions to be tested against observations.

These recent developments have motivated the development of CloudFlex, an open-source Python package capable of modeling cool gas structures. CloudFlex constructs these structures as cloudlet complexes, with properties such as total mass, size, and velocity distribution being based on user-specified parameters. It is also capable of predicting absorption-line signatures, which are what trace the cool disk-halo interface in observational studies. In this work, we extend the code to model absorption profiles of Ca II  $\lambda 3935\text{\AA}$ , a common tracer of the cool material at temperatures less than  $10^3$  K. Initial analyses of these profiles show that the incidence of Ca II detections decreases as the minimum cloudlet mass increases. As our predictions model multiple sightlines that probe the same extended gas features, we additionally compare our results to existing observations of Ca II column densities toward multiple background stars in the halo of the Milky Way. We plan to increase CloudFlex's versatility further, enabling more complex gas structures to be modeled and absorption-line signatures for other cool material tracers to be predicted. Once these features are implemented, we will use them to constrain morphological properties of the cool disk-halo interface.

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### 389 9:00 am 72

#### Development of a fluorescence-based assay to visualize protein-protein interactions implicated in inflammatory-based diseases

**Caden Unholz, Master's/Master of Science in Chemistry (M)**

The p50 subunit of transcription factor NF- $\kappa$ B binds to I $\kappa$ B $\zeta$  in the eukaryotic cell nucleus as part of a well-characterized response to select innate immune signals and initiates the expression of specific inflammatory genes. The NF- $\kappa$ B signal transduction pathway is associated with inflammatory-based diseases such as inflammatory bowel disease, arthritis, diabetes, and cancer. This study aims to identify small molecules or peptides that interfere with this interaction and assess them as potential inhibitors. Through the use of two different engineered fluorescent versions of the proteins, and the high affinity biotin:streptavidin interaction, we are creating a high-throughput screen for monitoring the status of the p50:I $\kappa$ B $\zeta$  protein-protein interaction. Thus far, we have designed, cloned, expressed and purified fluorescently-tagged versions of both murine p50 and human I $\kappa$ B $\zeta$  fused to green fluorescent protein (GFP) and mScarlet, respectively. Additionally, the I $\kappa$ B $\zeta$  construct has been designed with what we have characterized as a "Cys-His-Tag." The Cys-His-Tag contains a reactive cysteine amino acid that we have used successfully to biotinylate an mScarlet protein lacking I $\kappa$ B $\zeta$  with HPDP-Biotin for immobilization on streptavidin-coated 96-well plates. The success of this study suggests that we are now prepared to successfully biotinylate the mScarlet-I $\kappa$ B $\zeta$  due

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to the presence of its own Cys-His-Tag, which will allow us to immobilize it to a 96-well plate and introduce potential inhibitors for the p50 and I $\kappa$ B $\zeta$  interaction, in order to test the viability of this assay.

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### 390 9:00 am 73

#### Mathematical Models of HIV Infection in the Brain: Implication to Effective Treatment Regimens

**Audrey Oliver, Master of Science in Computational Science (M)**

Human Immunodeficiency Virus (HIV) continues to devastate millions of lives globally each year. Despite tremendous advances in the development of successful antiretroviral therapies (ART), currently, there is no cure due to the presence of viral reservoirs. As one of the least studied reservoirs, the brain poses an obstacle to a cure and, if left untreated, can lead to HIV-associated neurocognitive disorders (HAND). In this study, we create novel mathematical models, validated with data from SIV-infected macaques, to describe HIV infection in the brain and evaluate all possible combinations of drugs selected from a list of 25 FDA-approved drugs to control the virus in the brain. Using our model, we identify clusters of similar drug combinations, which we present using an interactive dashboard, allowing users to identify effective drug combinations to control the infection. We further extend the model to capture the spatiotemporal distribution of HIV particles across different brain compartments. We perform varying statistical analyses to determine the essential regions of the brain to track HIV particles and analyze the viral dynamics across those essential brain regions. We perform a thorough sensitivity analysis on the model parameters and compute the reproduction number to determine the condition for the persistence of infection in the brain.

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### 391 9:00 am 74

#### Modelling Protostars with Variable Accretion Rates

**Zoe Bozich, Masters of Science in Astronomy (M)**

How stars accrete their mass has profound effects on their size/radial evolution and stellar feedback properties. Numerical simulations of star formation often utilize stellar evolution models of protostars undergoing constant accretion, the process by which protostars accumulate mass. However, numerical simulations of star formation find that stellar accretion rates are highly variable. Here, we explore how variable accretion rates may alter the radial evolution of protostars as compared to stars undergoing constant accretion with the Modules for Experiments in Stellar Astrophysics (MESA) stellar evolution code. We include realistic stellar accretion histories taken from numerical simulations of star cluster formation and apply them to MESA to model the radial evolution of protostars that grow in mass via variable accretion. We then compare our MESA protostellar evolution models to similar models that employ constant accretion rate to determine if variable accretion significantly alters the radial evolution of accreting protostars.

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### 392 9:00 am 75

#### Bioconjugation of Gold Nanoparticles to Rare Earth Element Binding Proteins

**Sierra Murrell, Masters of Science Chemistry (M)**

Rare earth elements (REEs) are essential components of many high-tech electronic technologies, such as cellular telephones, hard drives, electric vehicles, and flat-screen monitors. The use of REEs in medical applications is increasing and includes treatments for tuberculosis, atherosclerosis, and hyperphosphatemia, and as contrast agents for MRI imaging. Historically, the lanthanides have been difficult to separate from one another because of their similar physiochemical properties. These difficulties are correlated to the fact that they exist primarily as 3+ ions and only differ by 0.19 Å when comparing the ionic radii across the lanthanide series. This presents a challenge for analyzing the proteins that we engineer to specifically bind REEs. A primary goal of my research is to develop a rapid and effective means of determining the thermodynamic and kinetic parameters associated with the binding of the lanthanides to the different rare earth element binding proteins (REE-BP) engineered in the Love Laboratory. To achieve this, we are bioconjugating gold nanoparticles (AuNp) to the C-terminus of the REE-BPs. The protein scaffold used to engineer the REE-BPs is protein G (G 1), which has been engineered to remain monomeric in the absence of metals yet forms dimers when incubated with REEs. G 1 is ideal for bioconjugation to AuNps because it folds robustly and contains no cysteine residues. For conjugation, variants of the REE-BPs will be expressed with C-terminal linkers that contain a cysteine residue. These will form a strong bond between the cysteine sulfur atom and the AuNps. As a control, we have already bioconjugated AuNps to G 1 variants that dimerize upon binding transition metals and have demonstrated that the spectra of the AuNps change appreciably upon incubation with Zn 2+. We now plan to add cysteine linkers to different REE-BPs for the purpose of characterizing the thermodynamic and kinetic parameters associated with REE binding.



# Abstracts of Presentations

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## Session G

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session G-1

Behavioral and Social Sciences 1  
Friday, March 1, 2024 11:00 am  
Montezuma Hall

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### 393 11:00 am 1

Making a Fresh Start: The Impact of California Resentencing Policies in San Diego County  
**Isabella Todd, Bachelors of Arts Political Science (U)**

Second-look sentencing has emerged as a new pathway for people to return to their communities in the face of previously long sentences. In California, the 2021 Penal Code 1172 reforms resulted in incarcerated individuals' potential eligibility to be released from prison. In response, the San Diego County Public Defender implemented the Fresh Start Unit to offer legal representation to these clients. The unit not only argues for reduced sentences on their client's behalf but also engages in reentry planning that includes service referrals. The current study relies on in-depth interviews with individuals returning to the community due to the reform. With an objective to understand the reentry process upon resentencing, we focus on clients' unique needs and the challenges they face in the context of returning to one of the most expensive cities in the US. A comprehensive insight into these reentry processes serves as a valuable addition to the literature and lends itself to suggestions on how the transition back into the community could be improved after a long sentence.

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### 394 11:00 am 2

Interactions between History of Traumatic Brain Injury and Sex on Cognition among Hispanic/Latino Adults

**Rubi Carpio Flores, Bachelor of Arts in Psychology: Emphasis in Neuroscience (U)**

Objective: Although traumatic brain injuries (TBIs) remain most prevalent among men, there is little evidence as to how TBI may affect cognition in men versus women, particularly in the Hispanic/Latino community. This study aims to test whether a history of TBI is associated with lower cognitive function in Hispanic/Latino adults of both or either sex.

Methods: We gathered data from the National Alzheimer's Coordinating Center (NACC) on 3,669 Hispanic/Latino adults (18-106 years; mean=69 years) from 41 sites between 2005-2022. The exposures of interest were self-reported history of TBI. Cognitive measures of interest included immediate and delayed recall (Craft Story 21), semantic fluency (Animal/Vegetable), processing speed and task-switching (Trails Making Tests A and B), attention and working memory (Digit Span Forward and Backward), and confrontation naming (Multilingual Naming Test; MIINT). General linear models were used to test 1) associations between a history of TBI with cognition and 2) modifications of these associations by sex. Models adjusted for age, sex (non-interaction models), education, and preferred language of testing.

Results: TBI was associated with higher scores on semantic verbal fluency (Animals:  $t = 3.385$ ,  $\beta = 1.010$ ,  $p = 0.001$ ; Vegetables:  $t = 1.977$ ,  $\beta = 0.447$ ,  $p < 0.05$ ) and confrontation naming ( $t = 2.779$ ,  $\beta = 0.966$ ,  $p < 0.01$ ). Sex modified the associations between TBI with semantic verbal fluency (Vegetables:  $t = 2.061$ ,  $\beta = 0.933$ ,  $p < 0.05$ ) and confrontation naming ( $t = 2.187$ ,  $\beta = 1.525$ ,  $p < 0.05$ ). Women with a history of TBI scored higher than all other groups on semantic verbal fluency. Regarding confrontation naming, men with a history of TBI scored higher than all other groups. There were no other significant associations between TBI nor the TBI and sex interactions with cognitive functioning.

Conclusion: Counterintuitively, those with a history of TBI had higher scores on semantic verbal fluency and confrontation naming tasks. There may be psychosocial aspects that impact self-report of TBI among Hispanic/Latino adults (e.g., education, greater resources for health assessments) which can be explored in future studies.

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### 395 11:00 am 3

Examining Autistic Adults' Driving Skills and Needs Through Driving Simulator Sessions

**Marialsabel Miller, Bachelor of Arts in Psychology (U)**

Introduction

Driving is a major factor leading to independence. Only a small number of autistic individuals attempt to or attain a driver's license. This study aimed to explore the support provided to individuals in a driving intervention program to further understand driving needs and challenges.

Methods

A total of 31 autistic participants were included in this study. All participants completed the Cognitive Behavioral Intervention for Driving (CBID) that included 8 weeks of curriculum delivered in a group setting along with 5 individual sessions on a driving simulator. A driving coach assisted with simulator sessions and recorded participants' behaviors, emotions, and driving skills. These qualitative reports were examined for recurring comments and organized into themes.

Results

Three main themes emerged from the data: 1) emotion awareness and regulation, 2) tactics to boost focus and attention, and 3) motor coordination practice. Emotion awareness and regulation was discussed in the session notes as "calming techniques are crucial and need to be worked into the sessions." Calming strategies included drinking water, chewing gum, and breathing during simulator sessions. The second theme, related to focus and attention, was described as participants being distracted by music, talking, or unforeseen road obstacles. An example of a comment on this theme stated that, "passengers talking made him really nervous and hard for him to focus on the road which is something to work on." The last theme that emerged was motor coordination and was discussed as braking, speed, and turning. Comments indicated that participants had trouble using motor skills smoothly and in coordination with each other.

Discussion

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The driving simulator session notes exposed multiple areas of needs for autistic individuals aspiring to drive. Comments primarily related to challenges with attention, emotion regulation and motor control. Comments suggested strategies to use to address these needs such as fidgets, gum/candy, and breathing in order to improve emotion regulation and attention. This study highlights some of the important areas to focus on while teaching autistic individuals to drive in relation to their demonstrated needs.

### 396 11:00 am 4

Education moderates the associations of family history of cognitive impairment with cognition among Hispanic/Latino adults

**Shaun Goycoochea, Bachelor of Arts in Psychology (U)**

#### BACKGROUND:

Family history of cognitive impairment (FH+) is a risk factor for cognitive impairment; however, this is not well studied among Hispanic/Latino adults. Therefore, in this study we aim to elucidate the associations of FH and cognitive outcomes in this population.

#### METHODS:

Participants were Hispanic/Latino adults (n=2868; ages=18-106 years, mean=70) from the National Alzheimer's Coordinating Center (NACC) data set (41 centers, 2005-2022). The exposure of interest was self-reported first-degree family history of cognitive impairment. The outcomes of interest was cognitive scores, including scores on learning and memory (Craft Story 21), semantic fluency (Animals, Vegetables), processing speed and task switching (Trails Making Test A and B), attention and working memory (Digit Span Forward and Backward), and confrontation naming (Multilingual Naming Test). Covariates included sex, age, education, heritage, language of testing, and NACC site. We ran general linear models to test the associations between FH with cognition and tested for modifications by education. T-values for robust standard errors reported when White's test were significant.

#### RESULTS:

Individuals with no family history of cognitive impairment (FH-) performed better on semantic fluency tests than FH+ (Animals:  $b=-0.5$ ;  $t=-2.27$ ,  $p<0.05$ ; Vegetables:  $b=-0.45$ ;  $t=-2.65$ ,  $p<0.01$ ). Higher levels of education were associated with better performance on semantic fluency, particularly among FH+ (Animals:  $b=0.09$ ,  $t=2.04$ ,  $p<0.05$ ; Vegetables:  $b=0.06$ ,  $t=1.79$ ,  $p=0.07$ ). In contrast, higher levels of education was associated with better task switching; this was stronger among FH- relative to FH+ (Trail B:  $b=1.94$ ,  $t=2.79$ ,  $p<0.01$ ).

#### DISCUSSION

Individuals with FH+ appeared to have lower semantic fluency scores; however, this was mitigated by more years of education. We found other evidence that higher education was associated with better cognition for both FH groups. This suggests that education may be protective of cognitive outcomes among Hispanic/Latino adults who generally have less educational opportunities. Future research should focus on examining

additional influences on the association between FH and cognitive aging (e.g. sex and income).

### 397 11:00 am 5

The Associations between Alcohol Usage and Cognitive Performance amongst Adults in the Hispanic/Latino Community

**Armando Lemus, Psychology (U)**

Background: Mild cognitive impairment and Alzheimer's disease (AD) are disorders of aging and cures remain unknown. High alcohol usage is a modifiable risk factor for AD that, if managed, has the potential to delay the onset.

Objective: We aimed to investigate the associations between alcohol usage and frequency with cognitive performance amongst adults in the Hispanic/Latino community using the National Alzheimer's Coordinating Center (NACC) dataset.

Participants: Participants included  $n=1,206$  adults who self-identified as Hispanic/Latino (63% female; 18-106-years, mean=69-years) from 33 testing centers (years: 2015-2022).

Methods: Alcohol use and frequency were assessed through self-reported consumption of any alcohol in the past 3 months (use: yes, no) and number of drinks consumed during this period (frequency: approximately less than once a month, once a month, once a week, a few times a week, daily or almost daily). Tests of interest included the Animal/Vegetable fluency test, Craft Story 21 Recall Immediate and Delayed, Trails Making Test Part A and B, Number Span Forward and Backward, and the Multilingual Naming Test (MINT). Covariates included sex, heritage, education, marital status, depressive symptoms (Geriatric Depression Scale), and testing site. Using general linear models, we analyzed the associations between alcohol usage and frequency with cognitive performance and in additional models tested for modifications by depressive symptoms.

Results: Higher alcohol use was associated with better cognitive performance across all measures (all  $F_s \geq 13.522$ , all  $p$ 's less than 0.001; all  $b_s \geq |0.557|$ , all  $t_s \geq |3.283|$ ,  $p_s \leq$  all  $p$ 's less than 0.001). Higher alcohol frequency was associated with better Trail A, Trail B, and MINT performance (all  $F_s \geq 6.884$ ,  $p_s \leq 0.013$ ; MINT:  $b = -0.303$ ,  $t = -2.064$ ,  $p \leq 0.05$ ). We found no significant interactions.

Conclusion: Contrary to expectations, higher alcohol usage and frequency resulted in better cognitive performance in the Hispanic/Latino community. Although we did not find significant interactions with depressive symptoms, future research should focus on the role of other psychosocial factors (e.g., stress) in the associations between alcohol usage and cognition.

### 398 11:00 am 6

The Impact of Early Intervention Services on Communication Development of Children with Autism

**Aoi Mori, Bachelor's of Science in Child Development (U)**

Atypical emergence of language and differences in social

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communication skills are common experiences for children with autism. Thus, language is an important target of autism intervention due to its significant role in development. Early intervention services, including Project ImPACT for Toddlers (PI for T), can foster the development of behaviors and skills for families who have children with or have high probability of autism. PI is a naturalistic developmental behavioral intervention (NDBI) and intends to positively affect the child's social communication, cognition, language, social engagement, and play skills (Ingersoll & Dvortscak, 2019; D'Agostino et al., 2023).

Based on previous findings, toddlers who experience social communication challenges should exhibit improved language skills after receiving PI for T, including verbal and nonverbal initiations pre- and post-intervention. Additionally, higher improvement of language should be observed in the children who participated in PI for T rather than Usual Care (UC) services, as NDBIs are known to improve communication skills.

This project draws from an ongoing project involving caregiver-child dyads receiving early intervention (EI) services in California. The team utilized 10-minute recordings of English- or Spanish-speaking caregiver-child dyads with children 12-36 months old ( $M=25$ ,  $sd=4$ ). These natural language sample (NLS) recordings are scored following a codebook to compare the number of verbal and nonverbal initiations that children displayed between families who were in the control group of usual care as compared to PI for T to determine whether there is a more significant impact of this treatment on the child's initiations during play interactions with their caregiver.

If able to conclude the effectiveness of NDBI services such as PI for T on communication skills, community providers can assist families when interacting with their toddlers by implementing and teaching necessary skills and knowledge to caregivers. This project further expands on the effectiveness of EI services on child development, specifically children with autism. Though this research may generalize to all NDBIs, PI for T can be an effective tool for developing communication skills. Early intervention providers could use the PI for T guidelines to build caregiver engagement skills and promote language development of children with autism.

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### 399 11:00 am 7

#### The Increase in Mother-Daughter Closeness After Participation in the Conmigo Program: An Intervention Program for Latina Mothers and Daughters

**Marian Carbajal, Undergraduate - Psychology, B.A. (U)**

A healthy relationship between preadolescents and their parents has been shown to help foster closeness in later years and is associated with health and quality of life outcomes. The current study examines how these healthy mother-daughter relationships can be achieved. Conmigo is an intervention that aims to improve health habits and outcomes in Latina mothers and their pre-adolescent daughters through activities of fitness, communication skills training, mental health, nutrition and puberty. This qualitative study examines the effects of the Conmigo program on mother-daughter relationships.

We assessed changes in mother-daughter closeness as measured by an increase in self-disclosure, communication, and duration/number of daily contact. It is hypothesized that those who participated in the program are more likely to report more mother-daughter closeness. Data was collected through qualitative interviews with both mothers and daughters post-program and analyzed using a rapid-qualitative approach where interviews were summarized and input into a matrix for analysis. Preliminary analysis suggests that there was consistency in increased feelings of closeness between mothers and daughters. Examples included daughters' reports of being able to talk to moms about new topics that they did not previously feel comfortable discussing and reports of decreased frustrations when communicating because the program fostered a stronger relationship. Results conclude that the hypothesis is supported by the data. An increase in mother-daughter closeness resulted after their participation in the Conmigo program. The results of this study contribute to a better understanding of the impacts of this program. The qualitative data gathered in this research can help us to further enhance the relational aspect of the program to maximize the benefits for participants.

## Session G-2

Behavioral and Social Sciences 2

Friday, March 1, 2024 11:00 am

Montezuma Hall

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### 400 11:00 am 8

#### Association of Adverse Childhood Experiences with Cigarette Smoking and Alcohol Use in a Low Income Migrant Community on the US-Mexico Border

**Anali Cruz, BA Psychology (U)**

Background: Tobacco smoking and alcohol use are prevalent in the U.S. and Mexico and are

associated with adverse health outcomes (e.g., cancer, cardiovascular disease). Prior research has shown that adverse childhood experiences such as abuse and neglect may contribute to substance use. However, few studies have explored these relationships in international border communities who experience substantial socioeconomic, psychosocial, and migration-related stressors.

Purpose: To examine the relationships of adverse childhood experiences (ACEs) with cigarette smoking and alcohol use in a low-income U.S.-Mexico border population.

Methods: This study is a cross-sectional analysis of a convenience sample of adults seeking care at a free medical clinic in Tijuana, Mexico in 2016. ACEs were measured using the 10-item Adverse Childhood Experiences Scale. Alcohol use and cigarette smoking were assessed with two items each: (1) current use: yes or no; (2) average number of drinks consumed or average number of cigarettes smoked per day. Linear and logistic regression models were conducted using SPSS

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Statistics Version v29 and controlled for age, sex, and level of education.

Results: Of 206 participants (M age = 47.2, SD = 11.9), 77% were male, 76% reported a history of migration to the U.S., and 58% reported a history of deportation from the U.S. to Mexico. The prevalence of current smoking and alcohol use were 44% and 40%, respectively. The mean number of ACEs reported was 3.7 (SD = 2.9) and 58% reported 3 or more ACEs. The most reported ACEs were parental separation (49%), household substance abuse (48%), and emotional abuse (45%). ACEs score was associated with current alcohol use (OR=1.12, CI: 1.01, 1.25), but was not associated with average number of drinks consumed ( $\beta=0.28$ ,  $p=0.43$ ), current smoking (OR=0.91, CI: 0.81, 1.01), or average number of cigarettes smoked ( $\beta=0.39$ ,  $p=0.24$ )

Conclusion: Adverse childhood experiences were prevalent and related to alcohol use, but not cigarette smoking, in this population. More research is needed to understand factors driving the high prevalence of tobacco and alcohol use in low-income individuals along the U.S.-Mexico border. Organizations that serve migrants and deportees may consider offering psychosocial support programs that address childhood adversities.

#### 401 11:00 am 9

### Association of Social Support with BMI and Obesity in a Low Income Migrant Community on the US-Mexico Border

**Jasmine Rincon, Bachelors in Psychology (U)**

Background: Obesity is a major public health concern in the U.S and Mexico. Social support is known to influence health behaviors (e.g., diet, physical activity) that are related to obesity, but research on the association of social support and obesity is mixed. Individuals living in migrant and low-income communities along the U.S-Mexico border are at elevated risk for both obesity and low social support due to socioeconomic adversity (e.g., food insecurity) and psychosocial risks (e.g., family separation, migration stress). Few studies have explored the relationship of social support and obesity in this population.

Purpose: To examine associations of perceived social support with body mass index (BMI) and obesity in a low-income U.S.-Mexico border population.

Methods: This cross-sectional study recruited adults seeking free medical care in Tijuana, Mexico, in 2016. Participants were 196 Hispanic/Latino adults >18 years old who spoke Spanish or English. Overweight and obesity were defined as a body mass index (BMI) of  $\geq 25$  and  $\geq 30$ , respectively. Perceived social support was assessed using the 12-item Interpersonal Support Evaluation List (ISEL).

Results: Participant mean age was 47.2 years (SD = 11.9), 76.7% identified as male, 76% reported a history of migration to the U.S. and 58% reported a history of at least one deportation to Mexico. Mean BMI was 26.8 (SD = 4.8). The prevalence of overweight and obesity was 40.5% and 20.9%,

respectively. Mean ISEL score was 19.6 (SD =5.9). Adjusting for age, sex, and education, social support was not significantly associated with BMI ( $\beta = -.007$ ,  $p = .924$ ) and was not associated with increased odds of overweight (OR = 0.99, CI = 0.94, 1.05) or obesity (OR = 0.99, CI = 0.93, 1.06).

Conclusion: Overweight and obesity were prevalent in this sample but were not associated with social support. Mean ISEL score was low compared to a large sample of Latinos in the US. Additional research is needed to understand the relationship of social support with weight and obesity in the low-income U.S-Mexico border population.

#### 402 11:00 am 10

### Social Touch and Close Connections: The Effects of Warmth and Deep Pressure

**Kylie Hawkins, Bachelor of Arts in Psychology (U)**

Research has consistently shown that social connection is an integral part of human health and well-being. This need and want to be close to others is part of what makes us human. More recently, nuanced avenues to increase and maintain feelings of social connection have been a focus of research. Social touch (hugging, high-fives, cuddling) are ways that we foster social closeness. The combined effects of warmth and deep pressure, two physical sensations involved in social touch, on the subjective human experience of social connection, however, has not yet been examined. Therefore, in a 2x2 within-subjects experiment, 69 participants (M age = 19.5, 81.2% women), were exposed to warm (activated commercially available warm pack) and non-warm temperatures (deactivated commercially available warm packs), and deep (20 pound weighted blanket) and light pressure (3 pound weighted blanket) while they viewed images of four different close others (M ratings of closeness = 8.82, (1) not at all close to me to (10) extremely close to me). To assess feelings of social connection, participants rated their feelings of connection and disconnection towards the person in the photo after each trial. Participants also completed the Multidimensional Assessment of Interoceptive Awareness (MAIA) in order to assess individual differences in interoceptive body awareness. After adjusting for age, there were no main effects of either temperature or pressure. Instead, there was an interaction such that warm deep pressure increased feelings of social connection compared to both warm light pressure and non-warm deep pressure. Further, higher scores on the trust subscale of the MAIA were related to higher feelings of social connection to warm deep pressure (vs. warm light pressure and non-warm deep pressure). In other words, those who experience their body as more safe and trustworthy also report greater feelings of warm deep pressure-induced feelings of connection. There was no effect on feelings of disconnection. Results show that the configuration of warmth and deep pressure together, increased feelings of connection with close others. These results directly implicate deep pressure as an important factor in how social touch helps keep us connected with important people in our lives.

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

**403 11:00 am 11****Parents engagement in their child's mental health services based on ethnicity****Jessica Lopez, Bachelors of Science Child and Family Development (U)**

Parent engagement is critical for children receiving mental health and other services. Unfortunately, it can be difficult for parents/caregivers to participate when there is a racial, ethnic, or language difference. Among different ethnic groups, the Latin/x/e community is a group that continues to face marginalization when it comes to mental health services. Latinos are one of the fastest-growing minority populations in the United States. In 2021, the Latino population reached 62.5 million (Zong, 2022), and it is projected to increase to 111.2 million by 2060 (Zong, 2022). Factors such as lack of information about the diagnosis or treatment, language barriers, immigration status, and cultural differences have contributed to the levels of services used and accessibility overall among Latinos (Alegri'a et al., 2007; Magana et al., 2013). Minorities, including low-income, Latin/x/e families, are more likely to have poorer engagement in child mental health services in comparison to non-Hispanic Whites (McCabe, 2002; Reyno & McGrath, 2006; Kapke & Gerdes, 2016). In addition to lower engagement in children's mental health services, the quality of care families receive is inadequate. Poor quality of services can occur due to cultural differences, language barriers, and provider's understanding and attitudes (Kapke & Gerdes, 2016). This points to the need for targeted efforts to enhance engagement in mental health services for Latino/x/e families, including training in existing evidence-based engagement strategies or interventions known to promote parent engagement. The aim of this project is to examine differences in clinician's use of engagement strategies following training in evidence-based parent engagement strategies. Data for this project are drawn from a larger project aiming to test an evidence-based executive functioning intervention in mental health services. As part of this project, mental health therapists were randomized to receive training in this intervention or usual care; intervention training included an emphasis on use of evidence-based parent engagement strategies (Haine-Schlagel et al., 2016). We will examine differences in both therapist's use of engagement strategies as well as parents in-session engagement behaviors using recordings of therapy sessions. Implications of findings will also be discussed.

**404 11:00 am 12****Stigmatization of Public Housing: A Sociological Exploration of the Frontier Housing Project****Belen Rashidi, Sociology BA (U)**

This presentation spotlights the forgotten publicly-housed community of Frontier, a neighborhood previously situated in what is now San Diego's Midway District. Built by the federal government during World War II, the Frontier Housing Project was originally intended to provide temporary housing for war production workers and military veterans, but many units remained in use for over 20 years. In 1955, the city seized

control of the area, and by 1962 all of the Frontier residents had been evicted. Although its existence was short-lived, Frontier changed significantly over time in both its physical and social landscape. In this presentation, we will focus on the social factors that contributed to Frontier's decline. We will analyze the stigmatization of both Frontier's residents as well as Frontier's physical location by local non-residents. By incorporating visual data from Frontier into our presentation, we will highlight the physical impacts of the stigma of publically housed residents. The implementation of visual research methods will also allow us to provide a longitudinal analysis of the long-term effects of public housing stigmatization. Lastly, this visual data will allow us to discuss this stigma in a broader sociological context, examining how the government reinforces the narrative that publicly housed communities are of lesser value, thus justifying the disposal of communities like Frontier.

**405 11:00 am 13****Concussion Care Seeking Intentions and Behavior Does Not Differ Between Ethnicities in Collegiate Athletes****Mikaela Garcia, Kinesiology, Pre-Physical Therapy (U)**

Context: Concussions are complex injuries to diagnose due to limited objective symptoms experienced. Seeking concussion care may be more difficult among historically underrepresented groups, including those with ethnicity differences, potentially due to cultural backgrounds. The purpose of this study was to compare concussion care seeking intentions and behavior between Hispanic/Latino and non-Hispanic/Latino athletes.

Methods: As part of a larger study, collegiate athletes completed a survey answering demographic items, and concussion care seeking intentions and behavior. Information obtained in the demographic section categorized participants into "Hispanic/Latino" and "Non-Hispanic/Latino." Both concussion care seeking intentions and behavior sections were divided into indirect and direct measures that were averaged. Indirect measures presented concussion signs and symptoms, and direct measures asked about concussions specifically. Indirect and direct behavior were subdivided as "care seekers" and "non-care seekers." Due to normality, Mann-Whitney U tests were used to compare indirect and direct intentions between ethnicities, and Chi-square tests were used to determine if indirect and direct behavior rates differed between ethnicities.

Results: Two hundred and thirty-nine respondents completed at least one item in this survey (completion rate=211/239, 88.3%; age=19.7 ± 1.6 years; male=95/239, 39.7%, females=111/239, 46.4%, intersex=1/239, 0.4%, androgynous=2/230, 0.8%, other=1/239, 0.4%, prefer not to answer=2/239, 0.8%; missing=2/239, 11.3%) with 60 participants identifying as Hispanic/Latino (25.1%) and 134 identifying as non-Hispanic/Latino (56.1%; no response=45, 18.8%). Regardless of ethnicity, approximately 66% of participants who sustained a concussion indicated they were "non-care seekers" (Hispanic/Latino: n=24/36, 66.7%; non-Hispanic/Latino: n=65/98, 66.3%). We observed no differences between ethnicities and intentions (indirect: p=0.996; direct: p=0.231) nor behavior (indirect:

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$p=0.868$ ; direct:  $p=0.971$ ) to seek care.

Conclusions: Our findings revealed no differences between ethnicities and concussion care seeking intentions and behaviors, however over half of participants did not seek care for a suspected concussion regardless of ethnicity. Interventional targets should focus on changing the larger concussion care seeking culture; not necessarily focused education considering ethnicity. Our findings highlight that other unexplored social factors may contribute to concussion care seeking outside of ethnicity.

## Session G-3

Biological and Agricultural Sciences

Friday, March 1, 2024 11:00 am

Montezuma Hall

406 11:00 am 14

*Mytilus Galloprovincialis* heart rate and valve-gaping behavior in response to acute salinity stress

Miles Ghannadian, Biology with an emphasis in marine biology (U)

Low-inflow estuaries in Southern California can experience rapid shifts in abiotic conditions linked to events such as tidal inlet closures and terrestrial runoff. Runoff from intense episodic rainfall events can rapidly shift water column salinity over the course of a few hours. Sessile organisms, such as bivalves, must change their behavior and physiology in order to tolerate the shift in conditions. The Mediterranean mussel *Mytilus galloprovincialis* became established in Southern California estuaries in the 20th century. In Los Penasquitos Lagoon (San Diego county), the population disappeared from the 1980s through the 2010s, potentially due to poor growing conditions linked to mouth closures and runoff, though the species has returned in recent years. We monitored the cardiac and valve gaping activity of *M. galloprovincialis* in response to rapid declines in salinity associated with large rain events in the field and in a controlled laboratory experiment designed to mimic the stress of rainfall events. As salinity declined, the mussels closed their valves and tended to remain closed throughout the duration of the low-salinity exposure. Prolonged valve closure was also found to be associated with a decline in heart rate, but heart rates rose to high levels following the reopening of the valves as salinity was increased. Mussels rapidly responded to changing salinity and appeared capable of tolerating the short-term impacts of large rain events, though they likely incur oxygen debt that must be recovered following the reopening of the valves.

407 11:00 am 15

The Role of Nutrients and Climate Change in Shallow Water Estuarine Dissolved Oxygen Dynamics

Samantha Irwin, B.S. in Biology (U)

Solomon's Harbor, MD, a shallow water estuary connected to the Chesapeake Bay, is suffering from a lack of dissolved oxygen. The two primary drivers of this oxygen depletion are the introduction of excess nutrients and climate change, which are known to increase temperatures and decrease dissolved oxygen (DO) levels. To better understand the factors that influence DO, we performed a univariate analysis of a 36-year-long historical dataset, deployed temperature sensors at seven sites for a month, and conducted dark box incubations on water samples collected on-site. Temperature was determined to be the strongest factor that explains DO, especially in bottom waters. Hydrodynamics were also impactful on DO and temperature because they determine water mixing, residence times, and variability at individual sites. Temperature was also strongly impacted by distance to the mouth of Solomon's Harbor, with sites further away having higher temperatures than sites close to the mouth. The sites furthest from open water have less mixing, higher residence times, more variability, are more heavily impacted by sunlight and weather, and have higher average temperatures, so these sites contain the most vulnerable habitat and should be closely monitored and made a conservation priority.

408 11:00 am 16

The Impact of Diet on Traumatic Brain Injury Responses of Adult Fruit Flies

Robert Squier, Bachelor of Science in Microbiology (U)

Long-term neural health requires the complex interplay between a wide range of factors. Our previous work has highlighted the versatility of *Drosophila melanogaster* models to explore genetic and environmental factors that promote or erode the long-term function of the adult CNS. Using both aging and traumatic brain injury (TBI) models we have identified autophagy pathway components (genetics) as well as dietary, probiotic and therapeutic treatments that promote healthy neural aging. In this study we examine the potential role that diet plays on adult fly responses following mild repetitive trauma (mTBI, 10x) exposure. We have shown an intermittent fasting (IF) regime promotes neural health as well as autophagic function in the aged fly nervous system. In this study, we will examine the impact that IF and exposure to high fructose corn syrup (HFCS) has on acute and long-term global trauma responses (mortality, longevity, inflammation profiles) and neural function (behaviors) following mTBI exposure. Fructose is a monosaccharide naturally found in fruits, honey, and sucrose (50:50 fructose, glucose). Consumption of HFCS has become a major concern in the USA, due to extensive corn production and commercialization of cheap HFCS into highly processed food. There is speculation that HFCS increases obesity, Type-II diabetes and other negative health outcomes compared to the consumption of sucrose. In this study, we will pre-treat male fruit fly cohorts (+400) on a) standard fly food; b) food containing 20% (w/v) HFCS; and c) standardized IF protocol for 10 days. Half of each cohort (~200 flies) will be mock-treated or exposed to standardized levels of trauma using our Bead Ruptor method (2.1 m/s, 10 bouts) and returned to their respective diets. The number of dead flies will be counted 3-times per week over the entire study and used to establish

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mortality indexes (1-D, 1-W, 2-W, 3-W) and lifespan profiles. Climbing behaviors or geotaxis responses (1-W, 2-W, 3-W post mTBI) will also be used to establish the relative impact of diets to modulate trauma responses using *Drosophila* as a high throughput in vivo model system of neural aging.

**409 11:00 am 17****A Gene Regulator (MacR) Controlling the Production of Molecular Syringes and their Application for Biotechnology****Alpher Alpher Aspiras, Bachelor of Science in Cell and Molecular Biology (U)**

The MACs Regulator (MacR), a transcription factor, emerges as a pivotal player in regulating Metamorphosis Associated Contractile structures (MACs) production in the marine bacterium, *Pseudoalteromonas luteoviolacea*. MACs are micron-scaled syringe-like structures classified as an extracellular Contraction Injection System (eCIS) that naturally target insect and mammalian cells, hinting at its potential as a tool for drug delivery to eukaryotic cells. We hypothesize that by elucidating the essential role of MacR, we will be able to drive the overexpression of MACs and boost their production rate and potential to become a novel drug delivery system. From RNA sequencing (RNA-Seq) data, we observed the downregulation of CIS gene clusters (MACs, Secondary Contractile, T6SS) in MacR knockout *P. luteoviolacea* compared to wild type (WT). To control expression of the *macR* gene, we used a promoter fusion with rhamnose inducibility. The assembled plasmid with *macR* was then conjugated into *P. luteoviolacea*. Visualization of protein output was carried out by fluorescent microscopy, capturing MACs with GFP-tagged overexpression via MacR. The byproduct of MacR overexpression would be used to kill HEK239 cells, showing its ability for targeted cytotoxicity. The MACs function not only emphasizes the importance of MacR as a transcriptional regulator in overexpressing production of MACs but also highlights the potential of MACs becoming a versatile drug delivery system. This study provides significant insights into the regulatory functions of MacR and its application in targeted cell-based therapies, presenting potential directions for future research.

**410 11:00 am 18****Understanding the role of conjugative plasmids in commensal-like bacterial adherence to the intestinal epithelium of *C. elegans*****Aaliyah Ringor, Microbiology (U)**

The role of microbial communities in shaping host health and function across diverse biological systems is a rapidly evolving field of study. *Caenorhabditis elegans* is an effective model organism for microbiome research due to its transparent body, allowing for direct observation of host-microbe interactions and providing a unique advantage in visualizing bacterial adherence to the intestinal epithelium. Additionally, the structure and function of its intestinal cells share similarities with those of

other organisms, enhancing the relevance of possible findings to broader biological contexts.

It is still not broadly understood how many commensal microbiome bacteria can colonize the gut. We discovered a gram-negative microbiome bacterium identified as *Lelliottia jeotgali* (LUAb3), that can colonize *C. elegans* through direct adherence to intestinal cells. We found that colonization of *C. elegans* by LUAb3 had a neutral impact on host fitness through lifespan and brood size assays suggesting that it is best classified as commensal-like. We recently identified a novel conjugative plasmid in LUAb3 which may be essential for colonizing the gut lumen. This novel plasmid (pLUAb3) contains genes encoding for fimbriae and adhesions, that have been shown to facilitate adherence by some pathogenic bacteria. To determine the role of this plasmid in bacterial adherence, we plan to transform non-adhering bacteria with pLUAb3 and observe changes in adherence. First, we aim to modify the plasmid by cloning in an antibiotic resistance gene via Gibson assembly as previous attempts using restriction enzyme cloning were unsuccessful. The inclusion of this antibiotic-resistance gene will strategically allow us to maintain pLUAb3 in other bacteria species to test its role in adherence.

Once we are able to genetically alter pLUAb3, we plan to determine if the plasmid is necessary and sufficient to confer adherence. The presence of conjugative plasmids in bacterial populations plays a pivotal role in this adaptability. Furthermore, exploring the therapeutic applications of this research for addressing gut-related diseases could open new avenues for improving human health. Overall, our research explores the possibility that virtually any bacteria could seamlessly integrate into the gut microbiome, broadening our understanding of bacterial interactions within complex ecosystems.

**411 11:00 am 19****Mutations in targeted *Achromobacter xylosoxidans* selected in response to phage therapy in the lungs of a cystic fibrosis patient****Branden La Madrid, Bachelor of Science (U)**

Due to increased prevalence of antibiotic-resistant bacteria, alternatives to antibiotics are being investigated and used. Phage therapy (PT) uses bacteriophages (viruses that infect bacteria, aka phages) to target and kill bacterial pathogens as an alternative to or in conjunction with antibiotics. PT targets specific strains of pathogens, including antibiotic resistant strains, rather than whole classes of bacteria, and causes fewer off-target effects. The Segall Lab is helping treat patients with Cystic Fibrosis with phages targeting antibiotic-resistant *Achromobacter xylosoxidans* infections.

PT may both reduce the numbers of pathogens so that the immune system is able to control the infection and select for phage-resistant pathogens. The latter mutations may concomitantly restore sensitivity to antibiotics and potentially reduce the pathogen's fitness and survival in the patient.

To maximize the effectiveness of PT, patients are treated with two or more phages that use distinct surface receptor proteins. Over the course of treatment, the bacteria are likely

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to accumulate mutations that inactivate receptor proteins, or host factors required for phage replication. If the phages used share the same receptor, phage resistance mutations blocking infection by one phage would likely block infection to all other phages using the same receptor.

To identify the mutations that accumulate during phage therapy of an *Achromobacter* patient, metagenomic DNA sequences obtained from the patient's sputum and blood samples were analyzed to acquire the metagenome-assembled genomes (MAGs) for *Achromobacter* strains in the samples. The *Achromobacter* MAG sequences from different points during therapy were compared to the *Achromobacter* MAG assembled from samples before the start of phage therapy. A list of all the genes, their genome location, and their functions was compiled, and the comparison highlighted mutations that accumulated over the course of therapy, generating a mutation timeline that shows when mutations appeared and if they were stable over time in the *Achromobacter* population. To date, the analysis has been completed for two samples; roughly 40 more samples are being analyzed. Once complete, mutations of interest will be highlighted for their relevance to phage and/or antibiotic resistance and to the fitness of *Achromobacter*, illuminating the progress of phage therapy.

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#### 412 11:00 am 20

##### Understanding Changes in Temperature and Heat Index in Imperial Valley, CA

**Samantha Madonia, Bachelor of Science in Environmental Sciences (U)**

As temperatures worldwide continue to rise, heat stress is becoming a growing area of concern (Cook et al., 2016). Farm workers in California face high temperatures that can expose them to heat stress; despite this, a considerable amount of Californian farm workers demonstrate only moderate knowledge of heat illness and lack sufficient precautionary measures for heat stress (Stoecklin-Marois et al., 2013). In the Imperial and Coachella Valleys, heat exposure increased between 1981 and 2020, and significant positive trends in extreme heat days occurred during the same period (Parker et al., 2022). Excessive heat combined with farm working conditions which increase metabolic rate can lead to serious heat related illness, and this was evidenced in the case of 17-year-old pregnant farm worker Maria Isabel Vasquez Jimenez, who tragically died in 2008 with a body temperature topping 108 degrees (Khokha, 2008). In order to identify risk for and prevent heat related illnesses in farm workers, this paper asks the question: How are temperature and heat index changing in the Imperial Valley, and what implication do those changes have on heat stress? As part of a project that aims to assess and identify factors that influence heat stress on workers, this poster will analyze trends and patterns in temperature and heat index in the Imperial Valley between 1983 and 2023. The findings could be used to determine factors of high concern for heat stress such as different crop types and times of year. This information could serve as valuable information in advising farmers and policymakers on safe practices for farm workers including frequent breaks, access to shade, and cooling stations.

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#### 413 11:00 am 21

##### Behind the Basket: Investigating the Nuclear Pore Complex Localization Domain of Megator in *Drosophila*

**Tristan McDonnell, Bachelor of Science in Biology with Emphasis in Cellular and Molecular Biology (U)**

Megator or MTOR is a 262 kD component of the *Drosophila melanogaster* nuclear pore complex (NPC). It has been implicated in nuclear architecture as a polymeric component of the nuclear and cytoskeletal matrices as well as in interactions with transcriptional regulator proteins. While it is known that Megator localizes to the inner nuclear basket section of the NPC, little is understood about how its function is specifically linked to its localization at the nuclear pore. To explore how MTOR anchors itself to the NPC and to map its NPC-targeting domain, we expressed truncated versions alongside the full-length MTOR in *Drosophila* S2 cells and assessed their localization relative to the nuclear pore complex. Using confocal microscopy on cells transfected with these deletion constructs, we were able to determine a fragment of MTOR that is likely responsible for localization to the nucleoplasmic subcomplex of the NPC. We are currently further refining this putative NPC-targeting domain through generating additional deletion constructs of MTOR. Furthermore, we identified several atypical nuclear phenotypes resulting from the ectopic expression of the intermediate deletion constructs. These findings provide a valuable foundation for further characterization of Megator's functional role as a nuclear pore component and as an intranuclear moderator of transcription and nuclear architecture.

### Session G-4

Engineering and Computer Science

Friday, March 1, 2024 11:00 am

Montezuma Hall

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#### 414 11:00 am 22

##### Machine-Learned Interatomic Potential for Grain Boundary Segregation in a Nichrome Alloy

**Hadia Hadia Bayat, Mechanical Engineering with Emphasis in Bioengineering (U)**

Our research outlines the process of developing a machine learning-assisted potential for a Nichrome alloy system. The goal is to study the atomistic dynamics which may lead to the phenomenon observed from laboratory TEM images where Cerium-rich precipitation occurs at grain boundaries and grain boundary junctions while under the influence of nano-current electrical pulses within a Nichrome system. Machine-learned interatomic potentials often suffer from spuriously large attractive forces when atoms are close together. This presents a problem for modeling NiCr alloys in electric fields where close interatomic separations may be induced by the field. We address this by building a comprehensive training data set and applying new regression methods. A diverse set of training data was generated and simulated with Quantum ESPRESSO based on simulating bulk modulus, equation of

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state, Ab-Initio Molecular Dynamics, and genetic algorithm structures for both Nickel and Chromium. These simulation results were used in FitSNAP to create, as well as optimize the two generated potentials for Nickel and Chromium. These preliminary potentials have been tested and showed that spurious attractive forces can be resolved using regularization schemes that penalize large changes in attractive forces at short bond lengths. This resolves key problems for training ML potentials for NiCr in E-fields as well as other materials in extreme conditions.

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**415 11:00 am 23**

### Enhancing the SCS1 Assessment

**Sophie Krivonosov, Computer Science (U)**

Assessments play an important role in gauging students' academic achievement and comprehension of key concepts. Prior research has demonstrated the value of the Second CS1 (SCS1) Knowledge assessment, a pseudocode-based assessment designed for introductory computer science courses. This is a widely-used assessment consisting of 27 questions that target 9 computing concepts. This project endeavors to revise the assessment and create a new version of the SCS1, called SCS1++, for broader use in computer science education research. We aim to do this by revising questions and introducing new questions within each conceptual area.

Given the scores from the initial assessment, it was unclear whether low scores were a result of student misconceptions or unclear wording of the questions. To obtain a better understanding of the SCS1 results, we used a variety of psychometric tests, including item difficulty and discrimination, to look into students' performance on each question independently. These analyses provided us with a quantitative measurement that allowed us to evaluate the efficacy of each test item. We used an iterative approach to review, revise, and reevaluate each question on the exam until they were deemed ready for a pilot study.

Furthermore, we expanded the question set for each conceptual area, allowing us to capture a broader spectrum of student understanding within each concept. This ensured that SCS1++ aligns with different conceptual areas of introductory computer science courses, while also increasing the range of difficulty on the assessment. With these adjustments, the assessment can better cater to diverse academic backgrounds of students, ensuring that the SCS1++ provides an equitable and valid assessment of student knowledge.

SCS1++ serves as a standardized, valid assessment, designed for instructors and researchers, to measure students' understanding of key computing concepts. It is a reliable tool for evaluating student computer science comprehension in various settings and for diverse educational goals.

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**416 11:00 am 24**

The effect of temperature distribution of powder bed in selective laser sintering on the quality of 3D-printed parts

**Kyler Brown, Bachelor of Electrical Engineering (U)**

Selective Laser Sintering is an additive manufacturing process that consists of creating a 3D product by melting powder together layer-by-layer using a laser. The goal for SURP 2023 was to gather test samples and sensor data to train AI Models to detect real-time errors in the Selective Laser Sintering process. This collection was done using the custom-built Laser Powder Bed Fusion 3D Printer in Dr. Kang's Smart Manufacturing and Metrology lab.

Throughout the process of attempting to collect samples, it was found that the nonuniform temperature distribution across the build plate led to curling. This curling would often cause the part to get caught by the spreader bar, causing the entire sample to get distorted, scraped off, and ruined. Too high of a temperature across the build plate prevents the powder from being able to cool; causing the build to stay molten. Too low of a temperature across the build plate prevents the powder from properly fusing together. A new baseplate using cylindrical heating elements, reflective insulation material around the print chamber, and a silicon heating pad on the backside of the print chamber were added to heat the print chamber more adequately.

As a result of these modifications, the print chamber and build plate experience a more uniform heating distribution. This uniformity has generated more uniform fusion between powder particles throughout the surface and higher consistency in pore densities throughout the sample prints produced by the custom-built 3D printer. Furthermore, this consistency allows Dr. Kang's Smart Manufacturing and Metrology lab to complete future research on training AI Models for real-time defect detection by enabling controlled reproduction of different print qualities through the modification of different laser settings such as scan speed and laser power.

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**417 11:00 am 25**

### Study of Thermal, Acoustical and Mechanical Properties of Xanthan Gum and Hemp Building Materials

**Sama Ahmed, Civil Engineering/ Bachelors (U)**

The most utilized material in construction is cement, which is also the source of 8% of the world's carbon dioxide emissions. Due to the increase in greenhouse emissions, there is a need to develop sustainable building materials, that are both low in emissions and fully renewable. This study focuses on the mechanical, thermal and acoustical properties of Hemp shives and different amounts of the biopolymer binder, Xanthan Gum. Samples are evaluated through compression test, three-point bending test, thermal test, and acoustical chamber testing. The compression test and the three-point bending test showed that there is a direct correlation between the increase of Xanthan Gum and the increase of flexural and compressive strength. Furthermore, the thermal testing results show that Hemp provides significant insulation regardless of the Xanthan gum amount. On the other hand, the acoustical test showed that there is a slight increase in noise reduction as xanthan gum increases. Hemp Shives are completely natural, lightweight, and

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have high insulation. The combination of these natural products yields environmentally conscious building materials suitable for multiple applications.

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#### 418 11:00 am 26

##### Exploring the Advancements in Additive Manufacturing through the Application of Artificial Intelligence

**Karam Alshaikh, Bachelor of Science in Mechanical Engineering (U)**

Physics-informed neural networks (PINNs) are deep-learning neural networks trained to solve tasks while incorporating the governing laws of physics expressed through nonlinear partial differential equations (Raissi et al., 2018). Integrating the law of physics ensures that the solutions provided by these neural networks are not only data-driven but also adhere to fundamental scientific principles, enhancing their reliability in real-world scenarios. As deep learning continues to gain prominence, exemplified by the emergence of ChatGPT, Physics-Informed Neural Networks play a pivotal role in constraining solutions to produce realistic outcomes. This alignment of artificial intelligence with physical models opens up new possibilities in various scientific and engineering domains, further bridging the gap between theoretical and applied research. They offer a valuable approach to efficiently map nonlinear data, even when limited data is available. This research project uses an innovative method to solve the one-dimensional heat equation effectively. It relies on restricted datasets simulated with ABAQUS and uses Physics-Informed Neural Networks to create a nonlinear heat model. By utilizing PINNs, the project aims to enhance the accuracy and efficiency of thermal simulations, potentially transforming practices in fields reliant on thermal analysis. This approach can help us produce additive manufacturing datasets at a lower cost, making them more accessible.

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#### 419 11:00 am 27

##### Exploring the Utility of Machine Learning Enhanced FEA in the Field of Metal Additive Manufacturing

**Luis Laurean, Bachelor of Science in Mechanical Engineering (U)**

In the context of powder bed fusion metal additive manufacturing (AM), finite element analysis (FEA) faces various challenges. Obstacles such as prohibitively high computational demands of accurate models and part defects that arise from sub-optimal process parameters are stifling the progress to be made in the field. Machine learning (ML) can significantly increase the accuracy and efficacy of the FEA of metal AM processes. It can do that by making accurate predictions of the complex phenomena that exist within the metal AM environment. This can lead to the optimization of process parameters such as part design, material usage, and more efficient process control. The drawback of ML for metal AM is its reliance on large, labeled datasets which in the field of metal AM, are prohibitively expensive. The need for models that can function with limited datasets cannot be overstated. It is

for this reason that physics-informed neural networks (PINNs) are being applied to the field of metal AM. These models are informed of fundamental conservation laws of momentum, mass, and energy to bridge the gap between a lack of data and accurate predictions. PINNs have successfully been applied to metal AM processes by predicting temperature and melt pool dynamics accurately with only moderate amounts of labeled data. However, the efficiency of PINNs is still highly dependent on the availability of that training data. This research paper summarizes the progress that has been made in the aforementioned fields and highlights the work that needs to be done to improve current efforts.

### Session G-5

#### Physical and Mathematical Sciences

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

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#### 420 11:00 am 28

##### The impact of invasive plant species on fire patterns in Otay Valley Regional Park, San Diego

**Anahi Mendez Lozano, Environmental Engineering (U)**

In San Diego, California, native vegetation provides critical benefits to riparian zones such as stabilizing streambanks, controlling erosion, providing habitat for wildlife, and regulating water temperature and are generally better adapted to a natural fire regime. However, anthropogenic disturbances such as waste and debris, urban development, and the introduction of invasive and non-native plants threaten native riparian vegetation communities and alter brush fire regimes. Otay Valley Regional Park (OVRP), one of the largest open spaces within southern San Diego County, experienced 21 riparian brush fires (1.5 acres total) ignited by people experiencing homelessness in September 2019. The goals of this study are to discern the influence of native and non-native vegetation on riparian fire patterns in OVRP. Satellite-based normalized difference vegetation index (NDVI) was approximated for disturbed, forest woodland, freshwater marsh, riparian forest, riparian scrub, and scrub vegetation types in OVRP. NDVI derived from Landsat and Sentinel-2 datasets were calculated seasonally and annually from 2018 to 2023 for comparison. The results of this research will provide guidance for fire management in urban riparian systems with native and non-native plant species.

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#### 421 11:00 am 29

##### Diel Cycles of Stem Water Potentials for Implications of Hydrological Connectivity between Hillslopes and Streams at the Angelo Coast Range Reserve

**Sirena Rodriguez, Bachelor of Science in Environmental Sciences (U)**

The Angelo Coast Range Reserve subsurface relationship between the dominant native trees –Madrones, Live Oaks,

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and Douglas Firs— and streams holds potential water use ramifications due to climate change. Furthermore, this relationship could impact year-round water availability within the reserve, in extended drought seasons. As subsurface interactions are not well-known or studied, our group focused on tree water use and plant water stress in correlation to the diel cycle of streamflow. Our research was prompted by the question; Can daily streamflow variation be explained by the plant water potential of different tree species at the end of the water year (2023)? With this, we sought to understand the relationship between diel cycles of stem water potentials and the hydrology of the Angelo Coast Range Reserve. To better understand how water moves between the trees and streams of the critical zone, we identified one of each tree species at each location and collected water potentials over 5 sampling time intervals at four locations on a hillslope, ranging from pre-dawn to dusk. Our data depicted statistically significant differences in water potentials between all three species at predawn ( $p$ -value = 0.0134) and midday ( $p$ -value = 0.0051). There was also a strong negative correlation between Madrones' water potential and stream gauge height (-0.708 and -0.961), and one strong positive correlation of water potential and stream gauge height rate of change in a Douglas Fir (0.786). As Madrones had the most prominent diel cycle and water potential compared to its neighbors, this implies that Madrones might have a deeper relationship with the hydrological system in this reserve. This could provide a better understanding of water potentials in sensitive regions. We anticipate that our findings can have broader water availability implications for studies on the relationship between water use and vegetation, and could potentially be used as a model for future research on climate change which causes increasing dry seasons in these vulnerable areas with unique biodiversity and habitat.

**422 11:00 am 30****How Does Foliage Cover Affect Water Temperature and Thermal Microrefugia for Trout Populations in the South Fork of the Eel River?****Jessica Keiser, Environmental Science (U)**

The Eel River watershed serves as habitat for endangered populations of steelhead trout. Their habitat is affected by warming water temperatures due to climate change. This research was conducted to document and analyze water temperatures at two pool locations within the river that serve as steelhead trout habitat and analyze whether foliage cover provides adequate thermal refugia. Data collection was conducted by installing nine temperature sensors total at both pools at a width of 2.5 meters apart, with 1-meter vertical intervals underwater, and reaching a maximum depth of 2 meters. Sensors recorded data at 15-minute intervals over the course of approximately 3.5 days. We also calculated foliage cover at each location using a spherical densiometer. Our parameters for adequate steelhead trout thermal microrefugia include optimal (10-20°C), tolerable (10-20°C), and intolerable ( $\geq 21^\circ\text{C}$ ) ranges (Greer et al. 2019)

**423 11:00 am 31****Thermal Properties of Vb- Defect in hBn****Alberto Pulido, Physics (U)**

The burgeoning field of two-dimensional materials promises revolutionary applications in electronics, thermoelectrics, and photonics, where hexagonal boron nitride (hBN) emerges as a material of significant interest due to its excellent thermal and electrical properties. This study delves into the thermal dynamics of hBN, focusing specifically on the role of negatively charged boron vacancies (VB-) in modulating its thermal conductivity. Leveraging a comprehensive suite of computational tools, we simulate the phonon transport within hBN lattices and elucidate the scattering mechanisms introduced by VB- defects. My investigation begins with a meticulous literature review to extract and synthesize existing experimental and theoretical insights into the thermal properties of hBN. Building on this foundation, we employ density functional theory and molecular dynamics simulations to model the interactions between phonons and VB- defects across a range of temperatures. Through these simulations, we quantify the impact of defect density and distribution on phonon mean free paths, group velocities, and ultimately, the material's thermal conductivity. Preliminary results indicate that VB- defects introduce localized phonon scattering centers, leading to a discernible reduction in thermal conductivity. The simulations suggest that such defects could be engineered to create hBN-based materials with customizable thermal properties for applications requiring precise thermal management. Additionally, my temperature-dependent analysis provides critical insights into the operational stability of hBN in various application environments.

My computational/theoretical approach not only offers a predictive framework for hBN's thermal behavior but also opens avenues for tailoring two-dimensional materials for specific technological needs. The theoretical models developed are positioned for future validation through experimental collaborations, aiming to bridge the gap between computational predictions and practical applications.

**424 11:00 am 32****R132H IDH1 mutant efficiency with modify  $\alpha 10$  helix****Aaron Le, Biochemistry (U)**

Human Isocitrate dehydrogenase enzymes (IDH) catalyze the conversion of isocitrate (ICT) to alpha-ketoglutarate ( $\alpha\text{KG}$ ), which is crucial in many pathways to support and maintain the health of cells. Isocitrate dehydrogenase enzymes have three different types with similar structures. IDH1 is located in the cytoplasm and peroxisome, while IDH2 and IDH3 are located in mitochondria. IDH mutations have been found in many types of cancer, including 80% of gliomas. These mutations confer a neomorphic NADPH-dependent reaction that reduces alpha-ketoglutarate into D-2-hydroxyglutarate (D2HG). The product D2HG inhibits  $\alpha\text{KG}$ -dependent enzymes, which can result in tumor development. Interestingly, when comparing the sequence of IDH1 and IDH2, most of the amino acids are

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identical except those found in the regulatory segment, which is comprised of the 10 helices. In the IDH1 enzyme, 10 helix has dynamic conformation as a loop and helical structure, yet it remains as a helix in IDH2. We hypothesize that the sustainability of IDH1 (both wild-type or mutant) function will be critical due to the connection of  $\alpha$ 10 helix helping to hold the substance in the active site. We are currently studying the variety of differences between IDH1 and IDH2 through kinetic analysis to portray a full picture of how mutations in this regulatory segment impact IDH1 and IDH2 enzyme efficiency. We created a series of mutations that recapitulate the sequence of IDH2's  $\alpha$ 10 helix in the IDH1 enzyme and measure catalytic parameters through a series of kinetic experiments. The results after swapping were surprising, such as some mutants showing a loss of activity. This study can help us better understand how IDH1 performs its tumor-driving reactions.

### 425 11:00 am 33

#### DES as novel reaction media for the investigation of amino acids for detection of past life

**Christian Sandoval, Bachelor of Science Microbiology CLS (U)**

The use of deep eutectic solvents (DES) as alternatives to conventional solvents has rapidly increased in the past decade. DESs' are non-aqueous solvents that are composed of a hydrogen bond donor and hydrogen bond acceptor that when combined, have unique properties such as increased thermal stability and chemical tunability. Typically, DES are mixtures of natural products, offering a green and biodegradable alternative to traditional non-aqueous solvents. Applications for DES range from nanoparticle synthesis to protein extractions. Our work explores using, ethaline DES, as a solvent for non-aqueous fluorescent labeling with application for the detection of past life on planetary rocks in future space missions.

Our previous research has shown the promise of DES being an alternative solvent for the fluorescent labeling of amino acids. Using fluorescein isothiocyanate (FITC) we were able to label amino acids dissolved in the DES at concentrations as low as 4  $\mu$ M. However, this may not have the sensitivity necessary for successful biosignature detection on Mars. In planetary rocks, the availability of amino acids is anticipated to be in the sub nanomolar range. For this reason, 5-carboxyfluorescein succinimidyl ester (5-CFSE), a much more reactive fluorescent dye for amino acid labeling, is being explored. Our work will present the method development process for the optimization of ethaline DES as an alternative solvent for labeling amino acids with 5-CFSE. We are exploring how modifying the pH of the DES through chemical additives, and how the temperature of the reaction can improve the labelling efficiency.

Capillary electrophoresis coupled with laser induced fluorescence (CE-LIF) has been widely used for the detection of amino acids from planetary analogs due to its sensitivity and low sample consumption. The instrument will similarly be used to examine and quantify the changes in amino acid labelling that occur as we modify the reaction conditions. With special attention being paid to the separation of side products and unreacted dye from the labelled amino acids.

### 426 11:00 am 34

#### Utilizing Conformational Control as a Filter to Obtain Selective 3-Aryl Pyridone Kinase Inhibitors

**Aaron Roberts, B.S. in Cell and Molecular Biology (U)**

Atropisomerism is a form of axial chirality that develops when there is hindered rotation about a bond. Currently, over 85% of all FDA approved kinase inhibitors have a rapidly interconverting atropisomeric axis. We hypothesize that while one atropisomer will bind to the target active site, the other atropisomer can bind to off-target kinases, leading to undesired side effects that are rampant throughout many FDA approved drugs. In addition to this, we predict that selectivity towards a particular kinase can be improved by tuning the dihedral angle about the atropisomeric axis in a low energy conformation that corresponds to the desired target. Our aim is to obtain a potent and selective inhibitor of the receptor tyrosine kinase (RTK), c-KIT. Activating mutations and genetic alterations in this kinase have been identified in many cancers, including gastrointestinal stromal tumors, gliomas, and lung cancers. Our conformational energy mapping of the pyridone scaffold revealed that the FDA approved c-KIT/PDGFR $\alpha$  inhibitor, ripretinib, binds c-KIT in an orthogonal conformation about the aryl-heterocycle axis. While ripretinib is somewhat selective because it has been found to target a broad range of oncogenic and drug resistant c-KIT/PDGFR $\alpha$  variants, it has also been shown to inhibit several other RTKs, leading to undesired side effects observed in patients. As such, we aim to improve ripretinib's selectivity for c-KIT through tuning the dihedral angle about the sp<sup>2</sup>-sp<sup>2</sup> axis in a near-orthogonal conformation, aligning with the low energy binding mode of this kinase. We plan to achieve this by incorporating steric bulk adjacent to the chiral axis in the ripretinib scaffold to stabilize the dihedral angle in this conformation. In order to validate our hypothesis, we will obtain IC<sub>50</sub> values to determine the selectivity and potency of our compounds, as well as evaluate our inhibitors in cellular models of c-KIT driven cancers to study the effect of our inhibitors in vitro.

## Session G-6

Health, Nutrition, and Clinical Sciences 1

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

### 427 11:00 am 35

#### Determining the Best Practices for Providing End of Life care to Young adults with Terminal Cancer

**Kaylee Chirgwin, Bachelor of Science in Nursing (U)**

Facing a terminal illness diagnosis is a profound challenge, particularly for young adults dealing with cancer. This literature review delves into the imperative need for guidelines in the expanding field of end-of-life care, specifically concentrating on the distinctive needs of young adults. The review explores why the integration of palliative care into standard oncology practice would prove valuable to this demographic. Conducting

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

a systematic search yielded fifteen pertinent studies published within the last decade. The selected studies, encompassing survey-based research, secondary data analysis, and a systematic review, focused on young adults aged 18-39 diagnosed with terminal cancer. The research prioritized real-world insights, excluding studies more theoretical in nature. Findings from the selected studies revealed a limited understanding of end-of-life care for young adults with terminal cancer. The studies underscored the paramount importance of open communication and patient autonomy in elevating overall satisfaction with care. Patients expressed a fervent desire to be actively involved in decision-making processes, and underscored the significance of early communication about end-of-life care. In conclusion, healthcare professionals are urged to initiate conversations about end-of-life care early in the treatment process, actively involve patients in decision-making, and acknowledge their capacity to make choices, including determining the location of care. Implementing these interventions has the potential to markedly improve overall satisfaction with care, providing young adults with terminal cancer greater comfort, dignity, and control in their final moments. This comprehensive approach fosters a more compassionate and supportive end-of-life care experience for both patients and their families.

**428 11:00 am 36****Diaphragm Force and Mitochondrial Function Ex Vivo Following GSNOR Inhibition In Vivo Preceding Mechanical Ventilation****Simon Pierce, Kinesiology (U)**

During mechanical ventilation (MV), force developed by the diaphragm is decreased over time much faster than locomotor muscles. This is known as ventilator-induced diaphragm dysfunction (VIDD), and VIDD may be accelerated by intramyofiber oxidative stress. An important free radical used for the treatment of acute respiratory distress syndrome (ARDS) is nitric oxide (NO) which can diffuse to diaphragm myofibers during treatment. However, little is known whether NO or NO by-products such as S-nitrosothiols (RSNO), can accelerate or prevent VIDD. **PURPOSE:** To investigate whether inhibiting S-nitrosogluthione reductase (GSNORi) during MV could affect ex vivo diaphragm force and mitochondrial respiration. **METHODS:** Male (C57BL6J) mice (n=27) were anesthetized and subjected to MV for 2, 4, or 6h, and non-MV mice (0 h) were used as controls. Alternatively, mice were treated with PBS/10% DMSO (n=6) or 25 µg SPL-334 (GSNORi, n=6) or 25 µg SPL-334 + 1.7 mg isosorbide dinitrate (ISDN; n=6), and then subjected to MV for 2 h. After MV, mice were euthanized, and diaphragm strips were used for force or for mitochondrial oxidative phosphorylation and reactive oxygen species generation measurements. **RESULTS:** Peak tetanic force was decreased by MV starting at 4 h ( $30 \pm 2$  N/cm<sup>2</sup> vs  $26 \pm 1$  N/cm<sup>2</sup> vs  $23 \pm 2$  N/cm<sup>2</sup> vs  $18 \pm 4$  N/cm<sup>2</sup>, for 0 vs 2 vs 4 vs 6h MV, P=0.0097 one-way ANOVA). Peak force was not different between DMSO vs GSNORi (P=0.3834). Leak respiration (Mann-Whitney p=0.26; CI95 7, 45 vs 10, 68 pmol/s/mg), coupled-phosphorylating mitochondrial respiration (Mann-Whitney p=0.91; CI95 121, 180

vs 107, 215 pmol/s/mg), and H<sub>2</sub>O<sub>2</sub> flux in any of the respiratory states (e.g. coupled-phosphorylating Mann-Whitney p=0.26; CI95 30, 245 vs 4, 543 fmol/s/mg), were not different between DMSO vs GSNORi. **CONCLUSION:** VIDD was developed at 4 hours MV, but GSNORi treatment for 2 h did not produce any changes to VIDD and to mitochondrial function. These data suggest that if exogenous NO is not provided, inhibiting GSNOR in vivo alone does not affect diaphragm function ex vivo. Support: SDSU 2023 SEED Grant (to L.N.)

**429 11:00 am 37****Olfactory Nudging promotes short-term weight loss****Victoria Esparza, Foods and Nutrition (U)**

Odors guide food choices, yet olfactory strategies are not included in current interventions for weight loss. We posit that short and often unconscious exposure to “healthy” food odors can serve as an “olfactory nudge” (ON) to increase healthy food intake, while prolonged unconscious exposure to “unhealthy” odors elicits olfactory-specific satiety via “olfactory habituation” (OH). To explore the effectiveness of these strategies, we conducted a two-week pilot intervention with normosmic adults with overweight/obesity (N= 6F; 83% white; age:21-55 years old, BMI:28.8±3.3). The results showed a significant effect of olfactory strategies on weight loss [F(1,12)=6.591, p=0.02]. Individuals in the ON group (exposed to banana/strawberry fruit smells before lunch and dinner), experienced an average weight reduction of -1.6±1.1 lb. Similarly, the OH group(10-minute habituation to banana pudding/strawberry cake smells), achieved a weight reduction of -1.2±0.4 lb. There were no significant differences between the two olfactory conditions (p=0.89). The control group exhibited a smaller overall weight reduction of -0.3±1.8 lb, which was significantly lower than that of the ON group (p=0.05), but not significantly different from the OH group (p=0.16). All groups demonstrated a significant increase in Olfactory Awareness post-intervention (V = 26.5, p=0.04). The Self-Report Behavioral Automaticity Index (SBAI) showed a nominal increase only in the olfactory groups. No significant changes emerged in the diet intake measured through a 3-day food diary, Short Self-Regulation Questionnaire (SSRQ), and Food Craving Questionnaire (FCQ), post-intervention. These preliminary findings support the use of olfactory behavioral strategies to influence weight loss.

**430 11:00 am 38****Tube Feeding in Dementia: A Literature Review on Nutritional Outcomes and Complications****Christopher Le, Bachelors of Science in Nursing (U)**

With the increase of the aged population world-wide, there may be a subsequent increase in the numbers of elderly patients with dementia. As a result of declines in physical and mental capabilities, individuals with cognitive disorders such as dementia, may develop problems with eating independently. This may put them at a higher risk for malnutrition and related comorbidities, such as the development of aspiration pneumonia and pressure ulcers. In order to address this issue, Tube feeding is often used as a replacement to oral feedings.

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However, in recent years its use in this case has become increasingly controversial among healthcare providers due to a lack of strong data from randomized control trials. In addition, many lay people believe that tube feeding improves outcomes and prolongs life in the demented. Establishing a consensus on this matter is crucial for guiding healthcare providers, caregivers, and families in making well-informed decisions for this vulnerable patient population. This evidence-based practice literature review aimed to assess the effectiveness of tube feeding in enhancing nutritional status and reducing nutritional complications among those with cognitive impairment. The PubMed and CINAHL electronic databases were searched for studies published after January 1, 2015. Inclusion criteria included measurements of the mortality rate and/or nutritional status of patients with the intervention of tube feeding of any age. Each study analyzed patients with a diagnosis of dementia. No evidence was found to suggest that tube feeding as a replacement to hand-feeding improved nutritional status. Evidence was found that the risk of aspiration pneumonia and pressure ulcers increased in groups who received tube feeding by any route. Thus, based upon this literature review the use of tube feedings in those with dementia should be the exception and not the rule for nutrition.

**431 11:00 am 39**

### Designing Research Diets Using USDA Food Composition Tables and ICP-OES

**Christina Vialva, Chemistry (U)**

In designing diet interventions for musculoskeletal health research, ensuring accurate nutrient content of the diet is important. A researcher can design a diet based on the analysis of various foods using Nutrition Facts sections on food package labels, USDA food composition databases, or direct measurement of nutrient composition, i.e. Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) for minerals or macronutrient analysis. The purpose of this research was to compare nutritional content using food package labels, the USDA food database, and direct measurement, from a representative Western Diet from our research study. We tested the hypothesis that the Nutrition Facts information from food package labels overestimates actual, measured nutrient content. We employed quality control practices, including analyzing samples in triplicate and validating our methods with a certified National Institute of Standards and Technology wheat flour (reference number 1567b) sample. Reported calcium and sodium values for the total days diet summed from individual foods using food composition databases were consistently lower than measured values by ICP-OES. Discrepancies were as great as 1.5 fold, contrasting with our hypothesis that the food package label overestimated nutritional content. This work illustrates that package labels should be referenced as estimates rather than accurate values for that product, and identifies specific foods that contributed to the overall discrepancy the most.

**432 11:00 am 40**

### Leached chemicals from secondhand blue and red

### cotton-polyester microfibers

**Tina Tran, Bachelor of Science in Environmental Sciences (U)**

Microfibers are a ubiquitous type of microplastic in the environment due to increased synthetic textile production. Microfibers are generated when fabrics are washed or degraded. Currently, there is a lack of research to understand the chemicals that can leach from synthetically dyed microfibers of different sizes. The use of nontargeted chemical analysis based on comprehensive two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (GCxGC/TOF-MS) can be used to detect a wide variety of chemicals. This project focuses on identifying chemicals that leach from secondhand blue-dyed cotton polyester (BCP) and red-dyed cotton polyester (RCP) microfibers (< 5mm) and fabric strips (~0.3 cm x ~5 cm) in laboratory-generated freshwater over 12 days. Among the BCP and RCP fibers and strips, 458 chromatographic features and 464 chromatographic features were detected, respectively. We detected more compounds in the BCP fibers (20.38 2.25) than in the strips (16.5 4.12), as well as in the RCP fibers (29 0.577) compared to the strips (22.88 3.12). We used relative abundance as a proxy for compound concentration, and we found no statistically significant differences in total average abundance in the fibers for both BCP and RCP samples. This suggests that size may not play a key role in the leaching rate of chemicals from microfibers and strips. Two of the most abundant compounds detected in the BCP and RCP leachates were the same: 2-phenoxyethanol and 2,2'-oxybis-1-propanol. Overall, many of the tentatively identified compounds from both samples can be classified into manufacturing-based chemicals and personal-use chemicals. Several of these chemicals were not plastic-associated. This study demonstrates that fabrics may serve as carriers for chemicals, associated with the individual's lifestyle and exposure, who owned the fabric, before testing, and the chemicals on the fabric can potentially leach these chemicals into aquatic environments.

**433 11:00 am 41**

### The Role of Mother's in Preadolescent Latinas Health and Eating Behaviors

**Mia Quintana, Bachelor of Arts in Psychology (U)**

Data demonstrates Latinx youth in the USA are disproportionately impacted by the obesity epidemic and experience other cardiometabolic health issues with greater prevalence, as compared with other similarly aged, non-Hispanic youth. Previous research on Latinx dyadic relationships have demonstrated the potential positive influence of parental involvement in a child's health behaviors. In addition, such research usually focuses on younger children, however preadolescence, specifically, is a significant time period as developmental changes occur and preadolescents begin making more independent decisions. Additional research is needed to understand maternal influence on Latinx youth during this fundamental period. The purpose of this study is to understand the influence of mothers in preadolescent Latina's healthy decision making. It is hypothesized that the more involved a mother is in her daughter's healthy eating

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habits during preadolescence, the more likely these practices will be adopted. Participants were recruited voluntarily among a pool of mothers and daughters from the Conmigo study, an intervention designed to improve the health behaviors and family communication among mother-daughter pairs. Individual interviews (n= 8) were conducted asking a series of questions regarding nutrition, parenting, and overall wellness, to mothers and daughters separately. Interviews were audio-recorded and transcribed by research staff in both Spanish and English, then summarized and analyzed in a matrix using a rapid-qualitative approach. Preliminary results indicate that mothers of preadolescent Latinas are very involved in the food choices their daughters make at home (mothers choosing what to serve, making separate meals, accommodating dietary needs and preferences). Many mothers regularly attempt to include their children in grocery shopping and cooking but with varied degrees of success. Mothers report experiencing challenges with limiting unhealthy snacks and encouraging trial of new foods. Results suggest that mothers can provide opportunities for nutritious dietary changes and offer innovative methods and conceptions regarding nutrition consumption, for their daughters. This research offers a unique perspective that research has not explored in the domain of healthy eating behaviors, specifically through the lens of parental strategies and styles. Findings contribute to greater knowledge on this relationship dynamic while highlighting the importance of maternal involvement in preadolescents' healthy behavior practices.

## Session G-7

Health, Nutrition, and Clinical Sciences 2  
**Friday, March 1, 2024 11:00 am**  
 Montezuma Hall

**434 11:00 am 42**

### Chipulines Cricket Chips: Jump to a More Sustainable Snack

**Daisy Lopez, Bachelor of Science Foods and Nutrition (U)**

Chips have found their way into almost every culture, often enjoyed as a component of a meal or snack. The Chipulines product was developed to elevate the protein component of traditional tortilla chips through the addition of powdered crickets (*Gryllodes sigillatus*), a sustainable protein source. The name Chipulines was inspired by chapulines, a Mexican delicacy made up of grasshoppers. To highlight the Mexican heritage of the recipe, Chipulines are made with blue corn masa enriched with edible insects, which have historically served as a dietary staple and cultural food for people indigenous to Mexico. As interest in sustainability grows, it is expected that the global market for edible insect products will grow as well, with sources projecting a 33% growth in demand in the coming years. Product development involved alterations to the chip's thickness, cooking methods, and flavoring. Physical analysis was performed to assess the chip's texture and water activity, indicating crispness and shelf life. The TA.XT Plus

Texture Analyzer was used to measure the force in grams needed to puncture each chip, while the water activity was measured using the Rotronic HW4 hygroscope, measuring the vapor pressure of free water released from each chip. Sensory evaluations were performed to assess consumers' overall acceptance of the product, based on taste, texture, and willingness to purchase. Data analysis from twenty participants found that most people perceived the flavor and texture as good (40% and 45%) or neutral (25% and 35%.) Information on intent to purchase found a significant increase in the likelihood to buy (from 30% to 70%) after the protein content of the chip was disclosed. The results from initial sensory testing have proven very promising, revealing strong demands for protein-enriched snacks and overall positive reviews for the chip itself. Chipulines plans to undergo further product development and experimentation to advance the texture and flavor of the chip. In the future Chipulines will look to expand the product line through the creation of new flavors and other cricket-based snack options, helping to grow consumer adoption of nutritious, sustainable foods.

**435 11:00 am 43**

### Comparing Reporter Versions for Executive Functioning Skills

**Bailee Chynoweth, Bachelor of Psychology (U)**

This study compares parent and teen reports on executive functioning skills using an item-level comparison on the Behavior Rating Inventory of Executive Function, Second Edition (BRIEF-2), a standardized executive function questionnaire widely used in clinical and research settings. The current version of the standardized assessment was published in 2015, and there is limited existing literature on informant comparisons, particularly using item-level analysis. Greater positive correlations between items across versions and fewer items that are statistically significantly different would indicate higher levels of agreement between reporters. This study analyzed baseline data from an executive function intervention involving nine neurodiverse participants between the ages of 10 and 13 years old and their caregivers. The BRIEF-2 includes 55 questions for self-report and 65 for caregivers, 35 of which overlap between the two versions. The quantitative analysis involved comparing the overlapping items from the self-report and parent versions to assess correlations and running independent samples t-tests to identify any significant differences across reporters. The correlation analysis revealed two items with significant negative correlations (Self-report #3. "When I'm given three things to do I remember only the first or the last." and 5. "My work is sloppy.") and two with significant positive correlations (Self-report #27. "I overreact." and 52. "I have trouble carrying out things that are needed to reach a goal (such as saving money for special items or studying to get good grades.)") on the BRIEF-2. The t-tests revealed that across the Self-report and Parent versions, 14 items were statistically significantly different. Ideally, these items would be highly positively correlated and statistically similar across versions, which was not the case in this study. These findings are particularly relevant to clinicians and researchers who rely on this measure when assessing executive function in

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children, as practitioners may have to consider the variability in scores across reporters. Future research should explore these specific item-level differences and their impact on the overall assessment of executive function. Additionally, efforts should be made to understand the factors contributing to the differences between versions and to improve the consistency of measurement across different respondents.

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**436 11:00 am 44**

### Health Care System Changes to Receipt of Cervical Cancer Screening Among Women Living with HIV in India: A Qualitative Study

**Emily Hernandez Rincon, Psychology with and Emphasis in Neuroscience (U)**

Health Care System Changes to Receipt of Cervical Cancer Screening Among Women Living with HIV in India: A Qualitative Study.

Purpose: Few studies have been published investigating ways to increase cervical cancer (CC) screening rates among Indian women living with human immunodeficiency virus (WLWH), who have the highest burden of CC. Despite this, Indian WLWH are rarely screened regularly for CC. This qualitative study explored patients' and stakeholders' suggestions for public health care system changes that may facilitate CC screening among Indian WLWH.

Methods: 25 WLWH receiving care at the NCH ART Centre (patients), as well as 15 healthcare workers providing care to WLWH at a public hospital in Surat, India (stakeholders), were recruited using a purposive sampling strategy. Interviews were audio-recorded, transcribed verbatim, de-identified, and, if necessary, translated into English by multilingual study staff.

Results: Participants suggested restructuring the Indian public healthcare system to get CC screening and test results more easily. In addition, participants suggested that it was important to improve communication between the ART Center and OB-GYN providers. It was suggested that additional types of healthcare workers (e.g., ART counselors) be trained to perform CC screening. Furthermore, participants emphasized the need to increase positive interaction between healthcare providers and patients regarding CC screening.

Conclusion: There are numerous ways to improve the delivery of CC early detection care in the public health system in India.

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**437 11:00 am 45**

### Association Between Pain Severity and Low Back Movement During Functional Activities in Latino People with Chronic Low Back Pain

**Viridiana Holguin Solorio, Bachelor of Arts in Psychology (U)**

BACKGROUND AND PURPOSE: Pain may affect tasks that are essential to everyday life such as lifting, sitting, and standing. The purpose of this study was to assess the association between pain severity and low back movement during functional tests, such as lifting a box and sit-to-stand, in Latino patients with chronic low back pain (CLBP). We predict that

people with higher levels of pain will have less movement during functional tasks than those with lower levels of pain.

METHODS: Baseline data from a randomized clinical trial were analyzed for 130 Latino people with CLBP. Participants completed a 20-minute movement assessment including a lifting and sit-to-stand task. Commercial sensors (dorsaVi, Inc.) were placed on the pelvis and lower back to measure maximum low back movement (in degrees) during the functional tasks. Pain severity was measured using the Brief Pain Inventory pain severity score. Categories of pain severity (low, moderate, high) were established for ranges of scores based on distribution of scores across the sample. A one-way ANOVA was conducted to examine the association between pain intensity (low, moderate, high) and maximum low back movement during the lifting and sit-to-stand tasks.

RESULTS: Participants were 46.2 (SD=12.6) years of age (64% women, 70% Spanish-speakers). There was statistically significant difference in low back movement during the sit-to-stand test between pain groups for right lumbar flexion ( $F(2, 125)=3.95, p=.022$ ) and lumbar left rotation ( $F(2, 125)=4.25, p=.016$ ). Tukey's HSD Test for multiple comparisons found that right lumbar flexion was significantly less for individuals with low pain vs. high pain (diff = -2.2; 95%CI=-4.18, -.29;  $p=.022$ ) and left lumbar rotation was significantly greater for individuals with low pain compared to medium pain (diff=1.7; 95% CI=.20, 3.20;  $p=.024$ ). No significant differences in low back movement were observed among pain intensity groups for the lifting task.

CONCLUSION: Participants with higher levels of pain displayed greater right lumbar flexion and less left lumbar rotation during a sit-to-stand task, suggesting pain may influence performance of this functional activity. Information from this study may help to explain the complex relationship that exists between performance of functional activities and pain experience in Latino people with CLBP.

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**438 11:00 am 46**

### Implicit Bias, Nursing Competency, and Patient Satisfaction: A Literature Review

**Dakotah Behrendt, Bachelor of Science in Nursing (U)**

Implicit biases place the hospitalized at risk for irregularities in care, which may contribute to disproportionate morbidity and mortality rates between specific patient populations. In order to better understand the implications of implicit bias surrounding marginalized patient populations and United States hospital care, a literature review was conducted. This literature review included primary research studies on American adults written in English between 2018 and 2023. Five studies relating either nursing competency or patient satisfaction to initiatives which combat implicit bias of marginalized patient populations were included. The collected quantitative and qualitative data from these research studies were analyzed to determine the state of knowledge on the topic. Limitations of the quantitative studies included the covert nature of implicit bias and the novelty of research, while limitations of the qualitative studies included researcher bias, low participation rates, and difficulty replicating results. The findings of the research supported the idea that

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the use of multifaceted implicit bias initiatives improve nursing competency and patient satisfaction to some extent. The available research was of reasonable breadth, but of variable depth; More research is needed within this realm of study to compare the effectiveness of different implicit bias trainings, initiatives, and programs. In the future, hospitals should consider implementing new training through evidence-based practice projects to promote progress in this area.

**439 11:00 am 47**

### Olfactory Training Wearables for Smell Loss - A Literature Review

**Kylie Macias, Bachelor of Science in Foods and Nutrition (U)**

**Background:** Wearables have emerged as powerful tools for real-time health monitoring of heart rate, sleep, physical activity, etc. Recent innovations in wearables technology has led to integration of smell delivery technology in compact wearable devices. However, the potential applications of this novel technology in supporting health are yet to be explored. Our scoping review has two objectives: 1) investigate the features of existing smell-emitting wearable/portable devices and 2) examine the utilization and impact of these health devices on health improvement. **Methods:** We conducted a comprehensive literature search across medical, design, and engineering databases, including Pubmed, Scopus, EMBASE, Cochrane Library, Web of Science, PsycINFO, IEEE Xplore, CUMINCAD, and ACM. Using the keywords wearable, olfaction, odor, smell, interface display, olfactory training, anosmia, COVID-19, and olfactory loss, we identified n=589,794 articles. We screened n=223 articles and included studies that described devices that are portable/wearable, emit scents, and/or tested to improve health. Based on these inclusion criteria, we identified n=37 articles, published between 1939 and 2023. **Results:** We identified smell emitting devices to be either body mounted (BMW) wearables (n= 22) or portable (PD) devices (n=15). The BMW were bluetooth operated and limited to head-mounted wearables with applications in virtual reality, face mounted as eyewear, and body mounted accessories. PD were identified as those that could be carried around and can be connected to a phone (n=3) or computer (n=1), placed on a desk (n=2), prototype designs (n=4), or handheld devices(n=5). Of the total 13 devices used for health improvement, six smell-emitting PD pre-screened for COVID-19, nudged study participants to reduce stress, increase alertness, stimulate appetite, reduce sitting time, and improve posture, and implemented smell training in smell loss patients. Seven BMW smell-emitting devices were used to reduce stress, improve sleep, enhance memory, and implement smell training. **Conclusion:** Our comprehensive review suggests a limited utilization of smell-emitting devices for health support. These devices show promising potential in improving health, particularly in addressing challenges for conditions like smell loss, PTSD, Alzheimer's, and head injuries.

## Session G-8

Behavioral and Social Sciences

Friday, March 1, 2024 11:00 am

Montezuma Hall

**440 11:00 am 48**

### Using Structural Equation Modelling for Understanding Relationships Between Students' Attitudes Towards Science and Science Career Choice

**Abel Sekone, Doctor of Philosophy in Mathematics and Science Education (D)**

This research is situated in the context of an NSF-funded Scholarships in STEM (S-STEM) grant emphasizing mentoring and undergraduate research that enrolls students from two Hispanic-Serving Institutions in Southern California, Southwestern College (SWC) and San Diego State University (SDSU). This program aims to increase the number of students with STEM degrees by providing scholarships and evidence-based activities to improve the recruitment and retention of academically talented students and encourage them to choose science careers. One known predictor of student persistence in science fields and science career choice is the extent to which students identify as scientists and are confident in their science skills. This perspective is aligned with the Social Cognitive Theory of Career (SCTC), derived primarily from Bandura's (1986) general social cognitive theory, which emphasizes how individuals exercise personal agency in the career development process and extra-personal factors that enhance or constrain agency. In this study, we modified the Social Cognitive Theory of Career (SCTC) framework to focus on how science self-efficacy, scientific identity, and perceived scientific values influence science career choice and how they may be associated with factors like gender, underrepresented status, course level, and majors. We tested three structural equation models using data collected from 259 students enrolled in chemistry courses at SDSU and SWC in spring 2022. Our findings support the modified SCTC model with scientific identity ( $\beta = 0.699$ ) being the most contributive latent variable to science career choice. Further, our expanded model (i.e., SCTC model +) posits a significant effect of gender ( $\beta = 0.134$ ) on scientific values, with male students feeling more belonging to science fields than females. The other expanded model (i.e., SCTC model ++ ) indicates significant direct effects of course level ( $\beta = 0.154$ ) on scientific identity, with students enrolled in introductory and preparatory chemistry courses reporting higher levels of scientific identity than those in more advanced courses. We also found a direct relationship between majors and scientific identity, with scores generally higher for the group of students majoring in STEM, including biology, chemistry, math, engineering, and computer science, than their peers who reported other majors ( $\beta = 0.339$ ).

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**441 11:00 am 49**

**Feasibility and Acceptability of Ecological Momentary Assessment (EMA) Methods among LGBTQ+ Adolescent Tobacco and Nicotine Users**

**Salgin Linda, PhD Public Health - Health Behavior (D)**

**Background:** Beginning in early adolescence, LGBTQ+ individuals display elevated rates of tobacco and nicotine use relative to their counterparts. Smartphone-based ecological momentary assessment (EMA) methods may be a useful tool in understanding smoking related behaviors among this population in real time. This abstract reports on the acceptability and feasibility of EMA methods used in Puff Break (an EMA Pilot) among our current adolescent sample.

**Methods:** Participants complete an exit survey evaluating the acceptability, appropriateness, and feasibility of the EMA. Quantitative measures include the 12-item Acceptability of Intervention Measure, Intervention Appropriateness Measure, Feasibility of Intervention Measure scales, and 6-item Mobile Application Rating Scale (MARS), App Specific Subscale. Both measures use a 5-point Likert scale ranging from "completely agree" to "completely disagree." Qualitative measures include seven open-ended responses to further evaluate acceptability and feasibility along with barriers and facilitators to using EMA.

**Results:** To date, 10 participants enrolled in the EMA trial have completed an exit survey. Results suggest using EMA has high acceptability ( $M=4.15$ ,  $SD=0.83$ ), appropriateness ( $M=4.36$ ,  $SD=0.75$ ), and feasibility ( $M=4.29$ ,  $SD=0.95$ ). The MARS App Specific Subscale also indicated high acceptability and feasibility for Puff Break to increase knowledge, awareness, and intentions to monitor tobacco and nicotine use ( $M=4.21$ ,  $SD=1.19$ ). A rapid content review of open-ended responses indicated that participants found Puff Break "easy to use" and offered opportunities for reflection. For instance, one participant stated, "it let me reflect on how I was feeling and if I was using vaping or marijuana to combat my stress" and another similarly stated, "it made me consider a lot about my cravings and usage and how it correlated with my stress levels". Participants also indicated that Puff Break had technical issues, early surveys were difficult to complete, and general life stressors not related to LGBTQ identity should be included.

**Discussion:** Early findings indicate using EMA methods to understand the impact of stress and socialization experiences on smoking behaviors in LGBTQ+ adolescents is feasible and acceptable. As the study progresses, identifying essential elements (e.g., decision points, tailoring variables) that can be used in future interventions for this population is important.

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**442 11:00 am 50**

**Beyond Borders: Understanding Cross-Cultural Variations in Implicit Skin Tone Preferences**

**Devanshi Upadhyaya, Masters of Arts in Psychology (M)**

Prior research on implicit skin tone preferences has mostly concentrated on individualistic cultures, often centering on the United States and overlooking other cultures. The present research aims to document the impact of cultural variations on

implicit biases across the globe. To test the idea that cultural attitudes persist beyond national borders, we compared individuals residing in their country of origin to individuals residing in the United States but who are citizens of another country. We hypothesized that variations in bias favoring lighter skin tones across countries parallels variations in bias across communities from the same countries in the U.S. We utilized data from the Skin Tone Implicit Association Test (IAT) available on Project Implicit. The sample included a total of 80 countries with a minimum of 100 participants from each country and each community, covering most regions of the world. The IAT involved participants quickly categorizing images of faces with different skin tones, alongside positive or negative words. Explicit skin tone bias was assessed through a self-report measure where individuals reported the extent to which they had a preference for light-skinned people or dark-skinned people. Initial analyses revealed an implicit preference for light skin across all countries and communities, however, it was much stronger in some cases than in others. As predicted, we found a robust positive correlation such that as the level of implicit preference for light skin tone increased in a country, it also increased in the communities that were tied to the same country. A similar correlation was found at the explicit level. These results suggest that culture plays a pivotal role as a source of variation in skin tone biases. The observed patterns indicate that individuals potentially acquire these biases from their specific cultural origins, extending beyond the influence of immediate environments. This work highlights how culture shapes implicit and explicit attitudes; preferences for skin tones are learned and passed down through multiple cultural mechanisms. The lasting impact of cultural influences on the formation of evaluative responses is documented here by showing that they persist even when individuals migrate to different lands.

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**443 11:00 am 51**

**Exploration of the Motivation to Control Prejudice towards Arab/Muslims at Individual and County Levels**

**Ashar Abdallah, Masters of Arts in Social Psychology (M)**

Although Arabs and Muslims are a significant and growing population in the United States, there is limited psychological research on prejudice towards this group. Prior research demonstrates that internal conscious efforts as well as social norms uniquely account for how people express prejudice. It has been suggested that Americans are less motivated to control prejudice towards Arabs and Muslims in comparison to other marginalized groups. The present research aims to provide an exploratory analysis of bias towards Arabs/Muslims and how it is moderated by internal and external motivators to control prejudice. Analyses were conducted at both the individual and county levels to gain understanding of how individuals may be affected by the motivations to control prejudice of those around them. We relied on data collected using the Arab/Muslim Implicit Association Test (IAT) available on Project Implicit between 2006 and 2016 ( $N=141,329$  nested within 670 U.S. counties). Motivation to control prejudice and

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

explicit bias were both measured by self-report questionnaires. Implicit bias was measured by asking participants to categorize, as quickly as possible, Arab/Muslim names as well as names of "Other People", in addition to positively and negatively valenced words. Most notably, we found that participants who displayed stronger internal motivation to control prejudice exhibited less implicit and explicit bias against Arabs/Muslims. However, external motivation was not similarly correlated with less prejudice. This suggests that strides to control prejudice due to personal beliefs moderately accounted for the biases individuals exhibit towards Arabs and Muslims, while adherence to social norms may not significantly alter expressed bias. These findings were analogous at the county level. Counties in which residents held stronger internal motivation to control prejudice displayed lower bias against Arabs/Muslims overall. Prejudice towards Arabs and Muslims in the United States largely fluctuates based on whether people try not to express prejudice based on personal efforts, and is fairly weak in individuals and contextual settings that hold stronger internal motivators. This study provides insight into how internal motivation can operate both at the individual and county level potentially through different mechanisms.

**444 11:00 am 52****Opportunities to improve sleep and circadian health in active duty service members****Emily Leslie, MPH Health Promotion and Behavioral Sciences (M)**

**Introduction:** Insufficient sleep and circadian disruption have both psychological and physiological consequences that impact the health and safety of military service members, yet research shows only about one-third of service members meet recommended sleep duration guidelines. To address this issue, interventions must be developed that are tailored to meet the specific needs of this community. Although substantial research has identified the adverse impacts of poor sleep, limited research has examined the underlying contextual factors that contribute to it between service branches or in different operational settings. Thus, the objective of this qualitative study was to identify factors that impede sleep health among active duty Marines.

**Methods:** Four focus groups were conducted with 23 active duty Enlisted Marines (87% male; 13% female). The semi-structured focus group guide assessed factors that impact sleep in Marines. Interview transcripts were analyzed using applied thematic analysis by two independent coders.

**Results:** All focus group participants reported low satisfaction with their sleep quality or duration. The most commonly reported barriers to sleep were work schedules. Many participants reported regularly working long and/or varied hours as part of their standard schedule, and others described unpredictable schedules due to frequently being kept at work late to complete unfinished tasks or for punitive reasons. Participants also described how Marine Corps culture influenced their attitudes towards sleep and sleep-related behavior — even when acknowledging the adverse effects of insufficient sleep on performance and mental health,

participants described forgoing it for the sake of the mission, e.g., "It's very important to keep in mind that mission accomplishment is more important than, like, a night of sleep."

**Conclusions:** Poor sleep and circadian health were viewed by study participants as inherent to military service. However, the most salient barriers reported by Marines are potentially modifiable through scheduling interventions and interventions designed to reduce sleep stigma and promote healthy sleep hygiene.

**445 11:00 am 53****Caregiving History and Attachment State of Mind in Foster Caregivers****Lucyann Atkins, Masters of Science in Child Development with a concentration in Early Childhood Mental Health (LPCC) (M)****Background**

Being a foster caregiver presents many challenges. They can have a few, tens, and even hundreds of foster children placed with them over the years. Each caregiver's attachment state of mind affects how they form a relationship with the child. This study examines the attachment style of foster caregivers and how this attachment style influences both the number of foster children caregivers have, and their feelings of accepting their foster child as their own.

**Method**

Participants are 137 caregiver-child dyads who participated in a larger randomized control trial of a preventative intervention for children exposed to early adversity (eleven caregivers had two children in the study, and one caregiver had 3). Assessments were conducted when children were approximately 27.4 months old (SD = 8.1). The majority of children (64%) and caregivers (53%) were Black, and the remaining included White, Hispanic, Biracial, and other people of color. The majority of caregivers were female (92%). Foster parent acceptance, commitment, and awareness of influence was assessed with semi-structured interview, "This Is My Baby" Interview (TIMB; Dozier & Lindheim, 2006). Foster caregiver attachment states of mind were assessed with the Adult Attachment Interview. Foster caregiver history and relationship to child was measured with a questionnaire.

**Results**

On average, foster caregivers had 8 foster children (SD = 24; range = 1-240). Sixty-nine percent of foster caregivers had a secure state of mind. Foster caregivers with a secure state of mind had a significantly higher number of foster children over the years (Secure: M=10, SD=3; Not Secure: M=3, SD=.5;  $t(87.8)=2.54, p<.01$ ). Additionally, higher numbers of foster children were significantly associated with lower levels of caregiver commitment ( $r=-.39, p<.01$ ) and acceptance ( $r=-.21, p<.05$ ).

**Conclusions**

Secure caregivers appear to have a higher capacity to care for a greater number of children over time, but the volume may negatively impact their commitment and acceptance. Future research should focus on interventions to support

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the caregiver-child relationship and assist the caregiver with navigating both the joys and hardships of serving as a foster caregiver.

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**446 11:00 am 54**

**The Effects of Choline Supplementation and Exercise on Fetal Alcohol Spectrum Disorders**

**Ilse Fleischer, Masters of Arts in Psychology (M)**

Exposure to alcohol during the prenatal period can have enduring effects on physical, neuropathological, and behavioral development, effects which are referred to as Fetal Alcohol Spectrum Disorders (FASD). In the United States, the prevalence of FASD is estimated to be between 2-5%. Despite this, treatment for individuals with FASD remains limited. One treatment that might mitigate the effects of prenatal alcohol exposure on development is exercise, as exercise increases neuroplasticity. Additionally, choline, an essential nutrient, may potentiate the effects of exercise by modifying cholinergic systems to enhance plasticity and accentuate the effectiveness of additional treatments such as exercise. The current study used an animal model of alcohol exposure during the third-trimester equivalent brain growth spurt to determine if exercise, choline, or the combination could reduce alcohol-related hyperactivity and anxiety. Sprague-Dawley rats (n=160) were exposed to ethanol mixed in a milk diet (5.25 g/kg/day) from postnatal day (PD) 4-9 via intragastric intubation; controls received sham intubations. From PD 10-30, subjects received choline chloride (100 mg/kg/day) or vehicle via subcutaneous injections. Then subjects were placed in cages attached to running wheels in activated or locked positions from PD 22-33. Following interventions, from PD 35-39, subjects were examined using an open-field activity chamber. Preliminary findings suggest that subjects developmentally exposed to alcohol exhibit increased locomotor activity, an effect that was mitigated by the exercise treatment. Similarly, subjects with developmental alcohol exposure entered the center of the chamber more frequently, and this was also mitigated with exercise, although the amount of time spent in the center did not differ significantly among groups. Increased center entries may suggest that alcohol exposure during the third-semester equivalent increases risk-taking behaviors, although it may also be related to general hyperactivity. Importantly, exercise treatment alleviated these effects, particularly among females, although sex differences failed to reach statistical significance. Preliminary data suggest choline may also have some effects, but surprisingly, the combination did not produce more beneficial improvements. Results suggest that exercise may reduce hyperactivity and emotional dysregulation in individuals with FASD, potentially improving quality of life. Supported by R37 AA012446 and T32 AA013525.

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**447 11:00 am 55**

**The Spanish Lexicon and New English Lexical Loans**

**Corregidor Luna Eva Maria, Masters in Spanish (M)**

Code switching is a complex linguistic phenomenon, but,

at the same time, it happens to be really useful to confirm the effectiveness and complex composition of the bilingual mental lexicon. In the case of Spanish and English, spanglish was born within bilingual communities, being highly reduced in non-border areas. Speakers are generally unaware of this linguistic phenomenon, although their decisions affect the whole community. Spanglish users subconsciously choose to use or not this new language variation, which can be given at any lexical, intersentential or intrasentential level. People tend to have predisposed linguistic attitudes towards code switching and are usually difficult to identify. The present research studies lexical loans from English to Spanish that are being used in a border region, Baja California, Mexico, and in a non-border region, Madrid, Spain. The work introduces a theoretical framework about linguistic attitudes, code switching, the matched-guise technique and previous studies that are relevant. The matched-guise technique of Lambert (1960) has been put to test to analyze the use of code switching in both contexts, including its relation with the age and gender of the speaker. The study will include 60 participants from diverse backgrounds, divided by age, gender, level of education, number of years studying English and place of birth and residence. By following this methodology, this article increases the number of studies about code switching and linguistic attitudes, since it has been acknowledged that the field is still in need of research.

**Session G-9**

Biological and Agricultural Sciences

Friday, March 1, 2024 11:00 am

Montezuma Hall

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**448 11:00 am 56**

**A Special New Software to Fill in Deficiencies in Trout Identification**

**Raya Esplin, PhD in Evolutionary Biology (D)**

Identifying unique trout species presents significant challenges due to morphological similarities and genetic complexity. This issue is critical as inaccuracies in habitat relocations can result in detrimental consequences, including the displacement, competition, and hybridization of relocated trout with native species, leading to diminished numbers and fitness of the latter. To mitigate the potential harm to at-risk species, accurate trout identification is paramount. Traditional methods relying on phenotypic variation for stock identification have proven insufficient in addressing this challenge. In response, we introduce Special, a user-friendly bioinformatics tool designed to revolutionize species identification. Leveraging next-generation sequencing (NGS) data, Special maps and identifies species-defining SNPs, transcending the limitations of current methodologies. Through Special, our analysis of initial reads from diverse trout species revealed 499,238 potential probes across seven species. These probes offer insights into the specific genomic regions where each subspecies diverges. The logical next step involves validating these probe locations

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through the utilization of a SNP chip. Researchers and scientists can now confidently turn to Speciel for precise trout species differentiation, thereby contributing significant advancements to ichthyology research. Beyond its immediate application, Speciel has the potential to enhance the development of projects requiring species-defining SNP-Chips. Importantly, Speciel's versatility extends beyond trout, making it applicable to any group of species exhibiting similarities. This tool not only addresses the pressing need for more accurate identification methods but also paves the way for expanded knowledge within the field.

**449 11:00 am 57**

### Intracellular Consequences of IDH1 Mutations in U87MG Cells

**Grace Chao, PhD Cell and Molecular Biology (D)**

Iso citrate dehydrogenase 1 (IDH1) catalyzes the NADP<sup>+</sup>-dependent conversion of isocitrate to  $\alpha$ -ketoglutarate ( $\alpha$ -KG) in the cytosol and peroxisomes. Mutations in IDH1 drive a variety of cancers, most notably gliomas and glioblastoma, and lead to production of D-2-hydroxyglutamate, an oncometabolite, and also prevent its normal activity, leading to decreased  $\alpha$ -KG and NADPH. Catalysis of isocitrate by wild type IDH1 yields the primary source of NADPH in peroxisomes, which are intracellular organelles found in virtually all eukaryotic cells. Peroxisomes are a crucial organelle involved in lipid processing reactions that require NADPH, including  $\alpha$ -oxidation of very long chain fatty acids,  $\alpha$ -oxidation of phytanic acid, degradation of H<sub>2</sub>O<sub>2</sub>, and biosynthesis of ether lipids. Because lipid biosynthesis is dependent on IDH1-derived NADPH, we hypothesize that cells expressing mutant IDH1 have dysregulated lipid levels due to NADPH deficiency. Traditional-omic studies focused on the whole-cell level do not give subcellular or organelle fluctuations. To study the impact of IDH1 mutations within cells, our lab has generated stable cell lines expressing wild type IDH1, R132Q, and R132H IDH1 mutants in U87MG glioma cells. Using transmission electron microscopy to visualize organelle morphology, we demonstrate that R132Q IDH1 mutant cells have disrupted organelle physiology compared to cells with wild type IDH1 activity. Both R132H and R132Q mutations exhibit retained lipid droplets and membrane abnormalities. Additionally, we demonstrate significant oxidative lipid degradation in R132H and R132Q in a lipid peroxidation study. Both these studies help us characterize the intracellular consequences affected by mutant IDH1-driven tumors, highlighting new therapeutically targetable pathways.

**450 11:00 am 58**

### Unveiling the Role of ID1-4 proteins in Cancer Stem-like Cell Maintenance and Contribution to Ovarian Cancer Recurrence Following Chemotherapy

**Megan Keene, Cell and Molecular Biology Joint Doctoral Program (CMB JDP) (D)**

Although most patients respond initially to chemotherapy,

ovarian cancer (OC) remains the most lethal gynecological cancer, primarily because over 80% of advanced cases relapse within 24 months. Current research suggests that cancer recurrence can be attributed to a small subpopulation of cancer stem-like cells (CSCs) that possess the ability to resist chemotherapy, self-renew, and asymmetrically divide to drive tumor recurrence. ID1-4 proteins, also known as inhibitors of differentiation or inhibitors of DNA binding proteins, regulate cell fate and differentiation in normal stem and progenitor cells. In gliomas, ID1-4 proteins have been identified as master transcriptional regulators of CSC identity, signaling to downstream pathways important for self-renewal, tumor initiation, and survival, but their role in OC CSCs and recurrence is unclear. We have previously found that ID1-3 gene expression increases following chemotherapy treatment in OC clinical samples and cell lines, and the elevated gene expression of ID1 and ID3 is associated with worse clinical outcomes. In subcutaneous xenograft mouse models, we have found that ID2 and ID4 protein expression significantly increases acutely following carboplatin treatment as compared to vehicle groups, but this effect is lost over time. We hypothesize that ID proteins are a required for OC CSC survival, self-renewal, and tumor recurrence following chemotherapy. Using a pan-ID inhibitor, AGX51, we have significantly knocked down ID1-4 expression in chemotherapy-naïve (OVCAR5, OV90) and chemotherapy-resistant (OVCAR4, OVCAR8) OC cell lines. Preliminary data suggest pan-ID inhibition in OC cell lines reduces chemotherapy resistance, and reduces chemotherapy-dependent increases in CSC surface marker expression by flow cytometry, stemness and EMT genes by qRT-PCR, and downstream targets, including IL-6, MMP2, and DLL3. Future studies will use siRNA silencing to further investigate the role of specific ID proteins in chemotherapy resistance, asymmetric division, spheroid formation, CSC maintenance by gene expression and flow cytometry, and signaling to downstream targets. These studies highlight a novel target important in CSC maintenance in response to chemotherapy that contributes to tumor progression and relapse. Understanding these mechanisms will allow us to develop novel therapeutic approaches to overcome chemotherapy-induced relapse and better clinical outcomes.

**451 11:00 am 59**

### A Machine Learning Approach to Predicting Tumor Status through Telomere Length Variation (TLV) Analysis

**Priyanshi Shah, Masters of Science in Bioinformatics and Medical Informatics (M)**

Telomeres, the protective caps at the ends of chromosomes, consist of a repetitive nucleotide sequence (TTAGGG) in humans and play a vital role in cellular aging and disease. With each cell division, telomeres shorten due to the end replication problem. Telomere shortening is associated with age-related diseases and early mortality and has implications for cancer biology, particularly in the context of cellular senescence and tumor progression. Our research, using data from The Cancer Genome Atlas (TCGA), aims to achieve three primary objectives:

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1. Quantify telomere length variation (TLV) across different cancer types and tissues. 2. Identify genetic variants associated with telomere length variation, spanning both cancer and non-cancer genomes. 3. Utilize estimated telomere lengths from the whole-genome sequencing (WGS) data and phenotypic data available on TCGA to train a supervised machine learning model that predicts tumor status (cancer versus non-cancer).

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**452 11:00 am 60**

### Shrinking Coastlines: Use of Uncrewed Aerial Systems to Map and Monitor Rocky Intertidal Habitats

**Elizabeth Bushnell, Masters of Science in Geography (GIS & remote sensing pathway) (M)**

Climate change influences rocky intertidal environments from regional to global scales, with predictions of dramatic habitat loss resulting from sea level rise (SLR). The temporal and spatial limitations of traditional laboratory and field-based research methods may soon render them insufficient for studying SLR effects on rocky intertidal zones. Uncrewed Aerial Systems (UAS), LiDAR, small camera sensors, and Structure from Motion (SfM) photogrammetry offer new options that allow ecologists and geographers to study this ecosystem type from a novel perspective and scale. However, work remains in identifying and matching information needs with available remote sensing technologies and tools, as well as conducting head-to-head comparisons of different methods to determine the best approach to mapping and monitoring rocky intertidal habitats. This work aims to fill some of these gaps by acquiring and comparing ultra-high spatial resolution UAS LiDAR and SfM datasets of the rocky intertidal environment.

In this study, a team of researchers and I collected UAS LiDAR and SfM photogrammetry datasets at three rocky intertidal sites in Laguna Beach, California. These sites are Heisler Park, Shaw's Cove, and Treasure Island, all of which are biological monitoring sites periodically monitored by the Multi-Agency Rocky Intertidal Network (MARINE). These sites have been chosen due to interest from the Laguna Ocean Foundation as well as proximity to each other, availability of MARINE reference data, and a lack of drone restrictions. MARINE has been conducting biodiversity surveys at over 200 sites along the Pacific coast for over 3 decades, however most sites are only surveyed every few years, so it is of interest to examine how UAS remote sensing can complement these efforts.

With support, I have successfully produced data products including orthoimages, point clouds, and DSMs. I have shown at Heisler Park that orthoimages, DSMs, and point clouds generally agree within 10 centimeters. Preliminary results indicate that SfM produces higher resolution DSMs and denser point clouds, but the LiDAR data was instrumental in providing control points to increase geometric accuracy of SfM products. I am currently working on generating 3D intertidal zonation maps.

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**453 11:00 am 61**

### Impact of Repeated Heat Stress on *Boechera*

*depauperata*

**Nathen Walton, Masters of evolutionary biology (M)**

Plants are sessile organisms that must withstand their changing environment to survive, including harsh conditions such as drought, salinity, and high temperatures. Due to climate change, heat waves have become more severe in terms of duration and intensity. Thus, the effects of rising temperatures on native plants' critical life stages have become a growing concern. Much is known about how model plants respond to a single heat stress but the effects of repeated heat stress on plants as on have yet to be vastly studied. This study aimed to examine the impact of repeated heat stress on *Boechera depauperata*. Seedlings 28 days old, before flowering, and 60 days old, flowering adults, were exposed to acquired heat stress at 44°C for 3 hours. One heat stress group underwent repeated heat stress, with heat treatments before and at flowering. Two additional heat stress groups underwent single heat stress, with one undergoing a heat treatment only before flowering and the other only at flowering. Chlorophyll fluorescence data was collected immediately after the plants experienced heat stress and after a 5-day recovery period. Ion leakage data was also collected after the 5-day recovery. Analysis of ion leakage determined that plants experience more heat-related damage when exposed to a single heat stress than when exposed to repeated heat stress. This demonstrates that *Boechera depauperata* retained some residual tolerance that protects it during its repeated heat stress. With the ability to acquire a higher thermal tolerance after an initial heat stress, *Boechera depauperata* exemplifies how certain plant species have a mechanism to improve their chances of survival in the wake of climate change. This makes them ideal candidates for further studies of how repeated heat stress impacts reproductive success.

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**454 11:00 am 62**

### Characterizing Extracellular Vesicles Released by Differentiated Extravillous Trophoblasts

**Omar Omar Shawn, Master of Science in Molecular Biology (M)**

Trophoblast are specialized epithelial cells of the placenta, and in human there are three subtypes: undifferentiated cytotrophoblast (CTB), and fully differentiated syncytiotrophoblast (STB) or extravillous trophoblast (EVT). Early in placentation, EVT migrate into the maternal endometrium where they anchor the developing placenta to the uterine wall and remodel maternal blood vessels to establish blood flow. Extracellular vesicles (EVs) are small, lipid membrane encapsulated structures that carry various biomolecules from the cells that release them. EVs exert their biological functions by delivering proteins, bioactive lipids, and nucleic acids to recipient cells. Therefore EVT-derived EVs may have important roles in feto-maternal signaling. Moreover, there is growing evidence that the cargo of EVs can reflect the functional state of the source cells, leading to interest in EVs as potential sources of disease biomarkers and as therapeutic vehicles. Techniques for tracing EVs and their cargo from cells of origin, through biofluids, and into destination cells are

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critically needed to decipher mechanisms of EV signaling. EV membranes are highly enriched in tetraspanins, a family of proteins with four transmembrane domains that are often used for EV capture and classification. The Laurent laboratory has optimized methods for multiplex vesicle flow cytometry (vFC) of EVs released by placental explants using antibodies against the tetraspanins CD9, CD63, and CD81. However, placental explants are comprised of several cell types, and thus release a mixed population of EVs. In this study, we aim to characterize the tetraspanins expressed on EVs released specifically by EVT.

The objective of this project is to generate a homogeneous population of extravillous trophoblasts (EVT) through the differentiation of in vitro trophoblast stem cells (TSC). Confirmation of successful EVT differentiation will be determined by flow cytometry, utilizing specific markers such as EGFR, HLAG, and ITGA1. Once confirmed, the focus will shift towards the isolation and purification of extracellular vesicles (EVs) from the EVT cell culture supernatant, utilizing 100 kDa molecular weight cut-off Amicon filters and Izon columns. The concentrated cell culture supernatant will be analyzed using vesicle flow cytometry (vFC), employing fluorescently labeled tetraspanin antibodies for characterization. In the upcoming phase, TSC differentiation into EVT will be performed followed by vFC analysis of the cell culture supernatant and a thorough examination of the cargo within the EVs.

**455 11:00 am 63**

Utilizing ultra-high spatial resolution drone imagery and satellite spectral vegetation indices (SVI) to study Payments for Ecosystem Services (PES) Zones in Chitwan, Nepal

**Brenna Fowler, Master in Geography (M)**

We employ remote sensing data and image processing tools to develop a novel approach in understanding ecological composition and the relationship between ecosystem services, conservation management programs, and wildlife interactions in Chitwan Valley, Nepal. Across the globe and in Chitwan, Payments for Ecosystem Services (PES) programs improve natural resource management by incentivizing local communities to regulate, provision, and bolster ecological services. The four PES zones in Chitwan differ in terms of access, animal occupancy, and resource extraction, spanning 1700 km<sup>2</sup>. The key question is whether the implementation and management through PES programs or differences in biophysical landscape properties and distributions within the zones influence wild animal habitat, occupancy, and behavior. We compare 13 subsets of image-derived vegetation structure metrics based on uncrewed aerial system (UAS) and spectral vegetation indices (SVI) derived from Sentinel-2 satellite imagery. Fine spatial resolution (3 cm) and highly overlapping UAS imagery were collected during a field mission in winter 2022-2023. Using Structure from Motion (SfM) photogrammetry, we generated high-density 3D point clouds and digital surface models (DSM) to estimate three vegetation metrics: canopy height, canopy cover, and gap cover. We ran regression analyses to quantify the spatial correspondence of UAS-derived

structure metrics with satellite-derived SVIs. Linear regression models show a strong relationship but with different spectral indices regressed against canopy height compared to canopy cover. Research findings are indirectly informative for assessing the influence of vegetation structure on animal habitat and occupancy relative to policy and natural resource management effects in PES zones of Chitwan Valley.

**Session G-10**

Engineering and Computer Science

**Friday, March 1, 2024 11:00 am**

Montezuma Hall

**456 11:00 am 64**

A 'Trap-and-Zap' Technology for Cost-Effective Removal and Destruction of Aqueous Phase Per- and Polyfluoroalkyl Substances (PFAS) at DoD Sites

**Rodney Leary, Joint Doctoral Program Engineering Science (Mechanical and Aerospace) (D)**

Per- and polyfluoroalkyl substances (PFAS) have been detected in groundwater, surface waters, and operation- or investigation-derived wastewater at hundreds of DoD sites. In particular, the use of PFAS laden aqueous film-forming foams (AFFFs) have been a major environmental liability for the DoD as they account for 75% of the use of AFFFs in the United States. As the pertinent environmental regulations are rapidly evolving, there is an urgent need for "more cost-effective and efficient technologies" to treat PFAS at DoD sites. As such, groundwater from a local DoD site will be used to represent the population of PFAS-contaminated groundwater found at DoD sites across the United States. While perfluorooctane sulfonate (PFOS) will be used as a probe compound in the material screening tests, 10 other DoD-relevant priority PFAS will also be targeted in assessing the overall material performances and optimization. Special attention will be placed to mitigating water matrix effects and treatment of complex mixtures of PFAS under DoD site conditions.

**457 11:00 am 65**

Cyber Vulnerabilities San Diego

**Anthony Tanay, Homeland Security (M)**

Probing questions of policies in place for cyber safety practices along with the application of software to detect possible attacks. Although having both is great not everyone can afford licenses or software to protect themselves leaving education being the forefront defense and bastion. A basic anonymous survey would be given to test the knowledge prior to the interaction of the company or institution. Just as the entry to attacking is not too sophisticated the effort to learn in order to be cyber safe will Education can serve as a low-cost wide filter to block extreme malware or intrusions by the simplest procedure.

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**458 11:00 am 66**

### Inspiring Mindful Consumption with Compassionate AI

**David Elizondo, Master of Business Administration (M)**

In an age dominated by consumerism, the concept of mindful consumption offers a pathway to align consumer behavior with ethical and constructive values. This thesis explores how Compassionate Artificial Intelligence (CAI) systems could potentially catalyze such alignment. For the purposes of this thesis, CAI describes theoretical frameworks rather than preexisting systems. Leveraging AI's data analytics and predictive modeling capabilities, CAI adds layers of emotional intelligence to foster more supportive and resonant interactions with users. The research focuses on CAI's potential to nudge consumers toward mindful lifestyles through real-time, context-sensitive prompts about the social, environmental, and intrapersonal implications of their actions. The study explores how we may utilize these frameworks to facilitate holistic well-being, presenting CAI as a revolutionary concept capable of fostering more thoughtful and humane consumption behaviors. Thus, this thesis serves as an investigation into how technology may be ethically and responsibly engineered to skillfully guide consumer behavior in service of humanity, and all life on Earth.

**459 11:00 am 67**

### Thermomechanical Properties of Polyurea Elastomeric Foam

**Sean Eckstein, Masters of Science in Mechanical Engineering (M)**

Elastomeric stochastic solids are emerging as suitable impact mitigation applications based on their superior mechanical behavior as a function of various operating, environmental, and loading conditions. Polyurea foams have shown exceptional potential as helmet liners, protective body pads, and shoe insole materials. Furthermore, polyurea foams inherit their bulk counterpart's superior environmental and mechanical behaviors. This research aims to extensively investigate the thermal and mechanical behavior of polyurea foams, assessing their response to moisture with different pH levels, temperatures, and mechanical loading. The heat flow rate of fabricated polyurea foam plugs was measured using differential scanning calorimetry (DSC) at a temperature ranging from -120 °C to 400 °C. The DSC thermograms were analyzed to extract the glass transition temperature, crystallization temperature, apparent melting/softening temperature, and enthalpy and latent heat. Second, foam plugs were submerged in deionized and saline water before pyrolyzing using a thermogravimetric analyzer (TGA) from room temperature up to 700 °C. The TGA thermograms elucidate the hygrothermal and decomposition behavior of polyurea foams as a function of the submersion solution. Finally, the time-dependent mechanical response of polyurea foams was quantified using a dynamic mechanical analyzer (DMA) at 1Hz and temperatures ranging from -100°C to 100°C, covering a broad range of loading conditions. The DMA results related the viscoelastic properties to the

stochastic microstructure of the foam. The outcomes of these investigations extend the applicability of elastomeric polyurea foams to a broad range of civilian and military applications while substantiating the process-structure-property interrelationship of stochastic elastomeric foams.

**460 11:00 am 68**

### In the Tijuana River Estuary, how do rates of fecal indicator bacteria reduction from the border to the estuary compare to the degradation rates of other wastewater surrogates?

**Alexandra Grant, Masters in Civil Engineering (M)**

The continual discharge of wastewater, sewage, and chemical pollution to the Tijuana River Estuary (TJRE) in San Diego, CA has resulted as a consequence of Tijuana's inundated and aging wastewater infrastructure and the International Boundary and Water Commission Wastewater Treatment Plant's (IBWC) inability to process the incoming wastewater.

Bacteria and viruses found in sewage are of specific pathogenic concern to human health; a previous study used caffeine concentrations to demonstrate that human waste is in fact the primary source of FIB in the estuary (Mladenov et al., 20xx). Another recent study confirmed that FIBs from contaminated ocean water are being aerosolized in seaspray and returning to land in Imperial Beach (Pendergraft et al., 2023).

San Diego State University's Wastewater Innovation and Reuse Lab (WIRLab) and the Biggs Watershed Science Lab have been monitoring water quality at an upstream and downstream site in the TJRE since 2021. FIB concentrations detected greatly exceed regulations set by the Environmental Protection Agency (EPA).

This study analyzes the rate of FIB reduction by comparing measured concentrations of two FIBs, E. coli and enterococci, at both monitoring locations during three conditions: 1) dry weather without cross-border flow, 2) dry weather with cross-border flow, and 3) wet weather with cross-border flow. Additionally, the study compares the aforementioned FIB reduction rates to the degradation of other wastewater surrogates including optical fluorescence indices, UV-vis absorbance, dissolved organic carbon (DOC), total dissolved nitrogen (TDN), and caffeine.

IDEXX kits with Cololert and Enterolert reagents were used to determine E. coli and Enterococci concentrations in the samples. The Horiba Scientific Benchtop Aqualog Fluorometer was used to measure fluorescence indices and UV-vis absorbance. The Shimadzu TOC-L CSH/CPN Analyzer was used to measure DOC and TDN.

Regulators and health experts can use these bacteria removal rates to determine FIB concentrations that will be discharged into the ocean under various weather conditions, incoming flow rates, and incoming FIB concentrations. Comparing FIB removal rates to those of the other surrogates will inform how reliable those surrogates may or may not be in determining FIB removal.

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session G-11

Physical and Mathematical Sciences

Friday, March 1, 2024 11:00 am

Montezuma Hall

**461 11:00 am 69**

### Kinetic and Structural Characterization of Human Isocitrate Dehydrogenase 1

**Elene Albekioni, Doctor of Philosophy in Chemistry (D)**

Isocitrate dehydrogenase 1 (IDH1) is a catalytic enzyme that supports cellular metabolite and redox environment balance. Catalytically competent IDH1 WT dimers convert isocitrate (ICT) to  $\alpha$ -ketoglutarate ( $\alpha$ -KG) in a metal ion and NADP<sup>+</sup>-dependent oxidative decarboxylation. This process yields NADPH, a critical metabolite providing reducing power in cells. Mutations in IDH1 were observed in multiple tumor types, including the most aggressive brain tumor glioblastoma. Cancer-associated mutations in IDH1 gain a new function to catalyze neomorphic enzymatic reaction – conversion of  $\alpha$ -KG to an oncometabolite D-2-hydroxyglutarate (D2HG). The majority of these mutations occur at the active site residue 132, which is involved in coordinating ICT. However, neither specific conformational changes nor precise mechanism driving the normal and neomorphic catalytic processes are understood. Here, we use hydrogen/deuterium exchange mass spectrometry (HDX-MS) to visualize structural dynamics and solvent accessibility in IDH1 dimers. Though HDX-MS is limited to peptide resolution, it reports on how the local environment changes in certain regions of the enzyme upon treatment with substrate(s). We hypothesized that local changes in ICT coordination and metal binding, and global changes from the inactive to active conformation depend on which substrate, and perhaps even which order the substrate is added. With this work, we demonstrated that drastic changes in deuterium uptake were observed around the regulatory domain in IDH1 WT. Moreover, neither Ca<sup>2+</sup> nor ICT alone caused these changes, only upon metal and substrate binding together was the catalytically competent, fully closed structure achieved. HDX-MS experiments with mutant enzymes showed different patterns from IDH1 WT; for example, active site peptides in IDH1 R132Q were less exposed to deuterated solvent. Then we extended our interest in observing heterodimerization between mutant and WT monomers of IDH1 and its effect on catalytic efficiency in normal and neomorphic reactions. For kinetic measurements, we used spectroscopic tools and characterized both the homodimer and heterodimer forms of IDH1 R132Q, R132H and R132L. Understanding how kinetic rates compare in the IDH1 homodimer and heterodimer complexes and the role of structural dynamics in catalysis as monitored using HDX-MS allow us to better understand the molecular mechanisms of IDH1 catalysis in health and disease.

**462 11:00 am 70**

### Nickle-doped Perovskite Nanocrystals for Selective Allylation of Indoles

**Nhu Dang, Chemistry (D)**

Metal halide perovskite (MHP) nanocrystals are not only an excellent material for solar cells but also an influential photocatalyst for complex organic synthesis. Interestingly, several research studies have been conducted on the effect of transition metal doping in MHPs for optoelectronic applications. However, the impact of such photocatalysts on organic reactions has not yet been extensively studied. In this study, we have doped CsPbBr<sub>3</sub>, an all-inorganic MHP, with Nickel (Ni) to provide a longer charge carrier lifetime and a lower recombination rate, thus improving the carrier transport efficiency and photocatalytic activity. The photocatalyst has then been tested to determine the reaction performance toward the selective allylation of indoles, an essential C–C cross-coupling reaction in drug development. Selective functionalization of indoles has always been a thriving area of research because of multiple possible substitution patterns in indole synthesis. This approach provides an economical, effective, and simple method for the allylation of indoles directly from olefins without the need for high-cost metals and complex preparations and has been able to initiate previously unsuccessful reactions.

**463 11:00 am 71**

### Phase Separation of Galectin-3 on the Lipid Membranes

**Ani Chakhrakia, Chemistry/Joint Doctoral Program (D)**

GAL-3 (Galectin-3) is the sole chimera-type member of Galectins, a family of carbohydrate-binding proteins and regulates various processes in both extra- and intracellular environments. Previous studies have reported that Galectin-3 undergoes LLPS (liquid-liquid phase separation) through its intrinsically disordered non-lectin NTD (N-terminal proline/glycine-rich domain) and can potentially be interacting with signaling proteins on the PM (plasma membrane). The solution-based studies showed that LLPS of GAL-3 is observed only in the presence of glycosylated proteins or LPS (lipopolysaccharides) that are present extracellularly. The field is mainly focused on studying functions of GAL-3 in the outer cell environments and thus, very little has been done to learn the intracellular functions of GAL-3 as well as to characterize the protein on the inner PM. Here we study the GAL-3 on the SLBs (supported lipid bilayers) and observe the LLPS behavior of the protein in the absence of multivalent interactions with glycoproteins or LPS. We have successfully purified and labeled GAL-3 with Cy3 dye via sortase ligation reaction and visualized through TIRFM (total internal reflection fluorescence microscopy). We found that membrane localization of the protein promotes cluster formation in the absence of multivalent ligands, which are required for clustering on the outer cell membranes. In our study the clustering was observed at as low as 5 nM concentration on DGS-NTA (Ni) (1-palmitoyl-2-oleoyl-glycero-3-phosphocholine (POPC) and 1,2-dioleoyl-sn-glycero-3-[(N-(5-amino-1-carboxypentyl) iminodiacetic acid) succinyl] (nickel salt)) containing SLBs. A growing body of evidence suggests that LLPS plays a crucial role in regulating spatial arrangement of signaling proteins

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and resulting in modulation of downstream signaling. GAL-3, undergoing LLPS through its intrinsically disordered NTD, can be a potential binding partner of RAS (Rat Sarcoma), facilitating its nanoclustering and other signaling proteins such as RAF (rapidly accelerated fibrosarcoma) on the inner plasma membrane. This research will provide valuable insights into the localization of GAL-3 on the two-dimensional surfaces to study the formation of clusters and analyze how molecular assemblies formed through LLPS can modulate and regulate signaling, identifying the activation mechanism of RAS/RAF kinase pathway.

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**464 11:00 am 72**

**BRAF binding specificity to KRAS4B on a lipid bilayer is controlled by specific regulatory domain interactions**

**Julian Grim, Doctorate/Chemistry and Biochemistry (D)**

Raf kinase is a key protein within the Mitogen Activated Protein Kinase (MAPK) pathway, transferring extracellular signals down to the nucleus through a chain of protein-protein interactions. Within this pathway, Raf is recruited to the inner leaflet of the cell membrane and relieved of autoinhibition by active Ras GTPase. Ras and Raf both have multiple isoforms that include key differences in structure, and the isoform BRAF has been shown to be highly specific in binding to KRas. Being important effectors of a cell's life cycle, Ras and Raf are both incredibly prevalent sources of cancer-causing cell signal dysregulation when mutated, and BRAF and KRas are both the most common for oncogenic mutations among their isoforms. To study the mechanisms underlying the specificity of BRAF and KRas, we expressed and purified the N-terminal BRAF-Specific Region (BSR) alone and with the conserved regulatory domains Ras-Binding Domain (BRBD for the BRAF isoform) and Cysteine-Rich Domain (CRD). In our fluorescence imaging of the m-Neon Green tagged constructs, BRBD alone efficiently recruited to a KRas-functionalized artificial supported lipid bilayer, but BSR-BRBD had around 80% lower binding affinity and the BSR alone showed no net recruitment. These results indicate that the BSR, despite being necessary for interaction with KRas, attenuates Ras-Raf interactions at the membrane and does not bind by itself to KRas. We hope to use these results in our further investigations of the uninhibition of full-length BRAF, a developing topic where the BRAF Specific Region may play a related role in initial recruitment.

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**465 11:00 am 73**

**Gotta Assess 'Em All: Evaluating the Ecological Health of Alvarado Creek With Multimetric Indices**

**Tierney Kim, Masters of Science in Civil Engineering [Environmental Engineering] (M)**

Urban landscapes are dynamic, which necessitates regular monitoring for sustainable water resources and environmental management. Evaluating the hydrological and biological conditions of urban creeks can provide insight about ecological disturbances and aquatic ecosystem health. Benthic macroinvertebrates (BMIs) are a metric to assess the health

of creeks, where differences in survival reflect the polluted or unpolluted state of the water. Environmental assessments, such as the California Stream Condition Index (CSCI), Hilsenhoff Biotic Index (HBI), and Benthic Index of Biotic Integrity (B-IBI), heavily rely on the BMI metric to calculate their assessment scores. Other assessments such as the California Rapid Assessment Method (CRAM) only utilize the BMI metric within one of its four different wetland scoring attributes (landscape & buffer, hydrology, physical structure, and biotic structure). These four environmental metrics range from poor to excellent conditions and will be evaluated in this study. We will utilize data from sampling events in 2016 and 2017 for Alvarado Creek, an urban tributary of the San Diego River, to calculate the four metrics and determine if a positive correlation exists between the indices. Seasonal and annual hydrologic and geomorphic measurements are available for Alvarado Creek, such as grain size distribution, stream channel dimensions, and water quality. Grain size distribution and streamflow measurements at or near the time of the sampling events will be used when available. Continuous streamflow, water depth, and stream temperature are also available. The existence of correlations between index results and water quality data for sites within San Diego County will be determined to make assumptions about the physical and water quality conditions at Alvarado Creek during the sampling events in 2016 and 2017. Index data will be paired with water quality data, provided by the Surface Water Ambient Monitoring Program (SWAMP), and statistically analyzed. Additional material regarding the benefits of ecological assessments, their academic impact, and their opportunity for citizen science will also be discussed.

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**466 11:00 am 74**

**Synthesis of atropisomeric selective RET kinase inhibitor**

**Ariel Pernela, Masters of Science in Chemistry (M)**

Atropisomerism is a natural phenomenon prevalent in drug discovery. It represents the hindered rotation around the bond of a molecule. Small drug molecules bind their targets in a specific atropisomeric set of conformations. The rotational flexibility of these compounds results in off-target binding and side effects in patients. Restricting the conformational space that is accessible for these scaffolds is a widely applicable strategy for enhancing target selectivity. The number of conformations around the atropisomeric axis can be restricted by introducing bulky substituents to hinder the rotation around the axis. The Gustafson group turned a promiscuous, rapidly interconverting pyrrolopyrimidine kinase inhibitor into an atropisomerically stable analog by adding bulky substituents at the ortho position. Restriction of the bond rotation resulted in a highly potent and selective RET kinase inhibitor, (R)-getretinib. The RET (REarranged during Transfection) gene, which encodes for a receptor tyrosine kinase, is an established oncogene associated with several cancers including neuroblastoma. Children at high risk with neuroblastoma tumors typically have only a 40% survival rate over five years with current medical treatments. The low survival rates connected to the current treatment demonstrate the need for innovative therapeutic strategies. The novel compound synthesized in our group

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demonstrated 8 nM activity towards RET kinase in cells which is 35 times more potent than the S atropisomer. R-getretinib displays good anti-proliferative activities in RET-driven models of thyroid, breast, and non-small cell lung cancers. Our ongoing research is centered on synthesizing (R)-getretinib at a larger scale and subjecting the compound to comprehensive studies in mouse models.

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## 467 11:00 am 75

### Comparing membrane interactions of RAF isoforms

**Vasili Revazishvili, Master of Science in Chemistry and Biochemistry (M)**

Membrane-protein interactions are essential for the proper functioning of cells. Understanding these interactions provides crucial knowledge regarding the molecular mechanisms that govern essential cellular processes. Rapidly Accelerated Fibrosarcoma (RAF) protein kinases are important part of the RAF-MEK-ERK signaling pathway, which plays a huge role in transmitting extracellular signals to the cell nucleus. This study investigates the membrane interactions of RAF protein isoforms BRAF, and CRAF focusing on elucidating their unique binding preferences in the Anionic lipid environment, consisting of 1,2-dioleoyl-sn-glycero-3-phospho-L-serine (DOPS), and 1,2-dioleoyl-sn-glycero-3-phosphocholine (DOPC) lipids. The comparison between three distinct constructs Cysteine Rich domain (CRD), Ras Binding Domain (RBD), and RBD-CRD of two isoforms (BRAF and CRAF) were studied. To Expand on this regard, we employed a Total Internal Reflection Fluorescence Microscope (TIRFM) technique, which allowed precise visualization of events occurring at the lipid-protein interface. For mimicking cell membrane, while having a controlled environment we used A supported lipid bilayer (SLB), a model system, which serve as a valuable tool for investigating different biological processes, including membrane-protein interactions. We also utilized the Fluorescence Correlation Spectroscopy (FCS) technique to determine the density of Raf. Our approach involved measuring recruitment binding rates of all three distinct constructs for both isoforms on RAS-free supported lipid bilayers. For effective imaging applications we employed site-specific labeling of a small inorganic dye, mNeonGreen (mNG). This methodology enables us to selectively visualize proteins of interest. Our findings show isoform-specific affinities for specific lipid composition, with a notably higher affinity observed towards BRAF in comparison to CRAF. This Finding will help to unveil the nuanced molecular interactions governing their membrane localization. Furthermore, we have quantified these interactions by calculating dissociation constants (Kd values) for each construct of both isoforms. The acquired KD values provide quantitative insights into the binding strength and affinities between RAF isoforms and cellular membranes, offering a comprehensive view of their lipid-specific preferences. The understanding of these isoform-specific membrane interactions will provide essential knowledge regarding the intricate roles of RAF isoforms in cellular signaling and potential implications for therapeutic targeting.



# Abstracts of Presentations

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## Session H

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session H-1

Behavioral and Social Sciences 1

Friday, March 1, 2024 1:00 pm

Montezuma Hall

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### 468 1:00 pm 1

Identifying Age Disparities in Student-Counselor Interactions: A Quantitative Communication Study on Feelings of Dismissal

**Miranda Mergens, Bachelor of Science in Health Communication (U)**

Under the theoretical framework of communication accommodation theory, the research group hypothesizes that lower division students experience feelings of dismissal within academic advising interactions more frequently than those of upper division students. Communication accommodation theory predicts and explains why individuals “make adjustments to increase, decrease, or maintain social distance” (Zhang & Giles, 2017). 238 students were surveyed at San Diego State University to measure their level of satisfaction and dismissal when communicating with their academic advisor, comparing the mean levels of dismissal between lower division students and upper division students in order to determine if there was a significant relationship between year in school and student feelings of dismissal during academic advising appointments. Participants who contributed to the study had access to the 23 item survey through an online database. The participants responded to each question on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). An independent sample t-test was conducted of the research data and statistical analysis produced values to determine a significant relationship between dismissal and level in school. The study demonstrated that there is a common threat of dissatisfaction between advisor and student. The data confirmed discrepancy between levels of dismissal between upper and lower division students. Lower division students had a higher level of dismissal when compared to upper division students. Advisor- student interactions are the primary access to guidance students have at a university therefore it's essential for mental well being and academic success that these interactions resonate with students as a feeling of satisfaction instead of dismissal.

Keywords: student-advisor communication, communication accommodation theory, dismissal.

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### 469 1:00 pm 2

Are Sound Baths an Answer to SDSU Student Stress? Lack of Access Suggests Not Yet

**Emma Fitzpatrick, Anthropology (U)**

Sound baths are a modality of self-care increasingly thought to remedy physical, mental, and spiritual ailments. Immersed in sound made on simple instruments such as gongs or chimes, individuals participate in a meditative experience while simultaneously de-stressing. College students are among the most stressed demographic (Heckman, 2019; Marksberry, n.d.),

and therefore would likely benefit from sound baths. The aim of this study is to determine how accessible sound baths are perceived to be by those enrolled at San Diego State University. I collected sound bath advertisements for content analysis. Then, I asked students from San Diego State to complete a self-report survey to better understand their knowledge on sound baths and opinions on accessibility. The findings from the survey indicated that sound baths, as a whole, are not yet an accessible form of self-care for SDSU students for reasons primarily including financial and informational accessibility.

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### 470 1:00 pm 3

The Connections Between Interoceptive Sensibility to Thermoregulatory Symptoms and Social Anxiety  
**Elijah Bautista, Bachelor of Arts in Psychology (U)**

Recent research suggests dysregulated thermosensory systems in affective disorders. Patients with major depressive disorder and anxiety often report sweating or chills, indicating difficulties regulating core body temperature. However, individual differences in how bothersome or distressing these symptoms are, termed interoceptive sensibility, have been understudied in relation to affective symptoms. Therefore, we examined the relationship between interoceptive sensibility toward thermoregulatory symptoms (IST) and social anxiety (SA). We hypothesize that individuals with higher IST scores will report higher SA scores. In an initial pilot study, healthy adult participants ages 18-25 (N=31) completed a newly developed IST scale (e.g., “It is important for me not to appear flushed”, “It scares me when I start to sweat profusely”). Participants also completed self-reports on SA using the Liebowitz Social Anxiety Scale (LSAS) and Fear of Positive Evaluation subscale (FPES). Self-report data were analyzed using Pearson correlations, with LSAS and FPES scores as the dependent variables, and IST as the independent variable. There are well-characterized sex differences in thermoregulation, therefore sex was included as a covariate. The reliability of the new IST scale was acceptable ( $\alpha = .786$ ). Consistent with the hypothesis, IST positively correlated with SA. That is, higher distress toward thermoregulatory symptoms was related to higher fear of positive evaluation ( $r = .308, p = .046$ ) and higher scores on the LSAS (to a marginal degree:  $r = .268, p = .073$ ). Results held when adjusting for sex (FPES:  $r = .310, p = .048$ ; LSAS:  $r = .293, p = .058$ ). In other words, those who reported higher self-reports on their distress towards their thermoregulatory symptoms were more likely to report higher social anxiety scores. Though preliminary, these results suggest a link between IST and SA. Individual differences in distress towards thermoregulatory symptoms correlated with higher SA scores across two different measures. IST may be a previously unrecognized risk factor in SA and can guide future research to further understand the importance of altered body-to-brain pathways in affective experience.

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### 471 1:00 pm 4

Chronic spine pain is associated with altered neural oscillatory dynamics during inhibitory control

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

**Sophie Gumanovski, Bachelor of Arts in Psychology:  
Emphasis in Neuroscience (U)**

Chronic neck/ low back pain (CP) is a prevalent public health problem that ranks high in disability and can result in cognitive and functional impairments and reduced quality of life.

Neuroimaging studies indicate altered activity of the cortical areas implicated in the “central neuromatrix” of pain, which overlaps with a frontal executive network subserving inhibitory control. This aligns with a higher incidence of attention-deficit/hyperactivity disorder (ADHD) in people with CP, and is consistent with top-down inhibitory deficits. However, there is a scarcity of research focusing on the neural dynamics of inhibitory control in this population.

The overall aim of this study was to examine behavioral and neural indices of inhibitory control in people with CP (N=17) and control participants (CNT, N=19), who were matched on demographics and cognitive abilities. Electroencephalography (EEG) signal was recorded while participants took part in a visual Go/NoGo task designed to probe the ability to inhibit prepotent responses. Data were analyzed in the time-frequency domain within the theta (4-7 Hz) range. Event-related theta power was higher on NoGo trials overall, confirming increased theta activity during engagement of cognitive inhibition. While behavioral performance did not differ between groups, the CP group exhibited lower theta power on inhibitory NoGo trials, which was associated with a lower Attentional Functional Index score and slower reaction times. Making more errors on NoGo trials was associated with higher scores on the Central Sensitization Inventory and pain-related avoidance of patterns of activity (POAM) in the CP group. Furthermore, behavioral inhibitory deficits in the CP group were associated with higher ADHD scores, which aligns with previously reported evidence. Taken together, these preliminary results are strongly indicative of top-down inhibitory impairments in CP, which may contribute to deficient downregulation of sensory processing. Furthermore, these findings support the notion that heightened pain perception in individuals with chronic pain may lead to increased focus on pain stimuli, potentially compromising cognitive control during tasks and consequent behavioral symptoms. The study provides insight into the intricate interplay between neural dynamics and chronic pain experiences.

**472 1:00 pm 5**

**Cooperation in STEM labs benefits student competency and authenticity**

**Jenna Majors, Bachelor of Arts in Psychology (U)**

In STEM majors, student participation in a faculty-led research laboratory is an important gateway to advanced degrees and employment. Typically, when undergraduate students participate in faculty-led research labs they are encouraged to collaborate with graduate students and faculty, helping everybody enhance their general knowledge. However, not every lab's atmosphere is the same and these differences may have impacts on students' experiences and development. Specifically, past studies have found that atmosphere has an impact on student engagement and self perception, noting that a poor atmosphere may lead to feelings of discouragement and

disengagement (Hildt et al., 2022). The current study examines whether students in more cooperative lab environments would hold higher feelings of competency and authenticity than students in less cooperative labs. Participants included 627 students working in 118 faculty-led research labs. Multilevel analyses found that students' ratings of their lab's cooperative atmosphere at baseline was significantly correlated with their perceptions of self competency ( $\beta=.22$ ) and feelings of authenticity ( $\beta=.37$ ). Further, additional longitudinal analyses suggest that cooperative atmospheres at baseline were significantly related to greater perceptions of self competency ( $\beta=.13$ ) and feelings authenticity ( $\beta=.15$ ) three months later, even after controlling for baseline ratings of competence and authenticity. These findings suggest that institutional resources and training designed to help faculty lab directors and lab managers create more collaborative lab environments should benefit student experiences and outcomes.

**473 1:00 pm 6**

**Initial Validation of a Mandarin Sentence Comprehension Tool for Bilinguals With Aphasia: Evidence From Healthy Individuals**

**Emily Mu, Speech, Language, and Hearing Sciences (U)**

Aphasia is an acquired language disorder frequently characterized by impaired sentence comprehension. Prior research shows that people with aphasia (PWA) experience greater difficulty comprehending noncanonical word order sentences (patient precedes agent; “The man [patient] is pushed by the boy [agent]”), as opposed to simpler canonical word order where agents precede patients. To effectively treat bilingual individuals with aphasia (biPWA), speech-language pathologists (SLPs) must assess both languages. While several English sentence comprehension assessments exist, such as the SOAP Syntactic Battery of Sentence Comprehension (E-SOAP), there is a shortage of equivalent Mandarin tests. Chinese dialects, including Mandarin, are the second most widely spoken non-English language cluster in the United States, indicating a need for more Mandarin assessments.

To address this need, we conducted two studies. Our purpose was to initially validate a Mandarin version of the SOAP (M-SOAP) that SLPs can use to characterize sentence comprehension abilities of Mandarin-English biPWA.

For study 1, 19 older unimpaired Mandarin-English bilinguals (Mean[age]=77yrs) who were Mandarin dominant completed the E- and M-SOAP. For study 2, 35 unimpaired Mandarin-English bilinguals (Mean[age]=42yrs) across the adult lifespan and with varying levels of language dominance completed slightly adapted versions of the E- and M-SOAP.

The SOAP is a sentence-picturing matching task that assesses canonical and noncanonical sentences. Participants are auditorily presented with a target sentence and must choose a picture that best represents the sentence's meaning from a set of three pictures: match, mismatch, and distractor. For the example sentence, “The man [patient] is pushed by the boy [agent],” the match picture depicts the agent and patient accurately engaging in the described action (“boy pushes man”), the mismatch picture depicts the incorrect interpretation with

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the reverse action ('man pushes boy'), and the distractor picture depicts the characters engaging in an unrelated action.

Results from both studies revealed significantly greater accuracy for canonical sentences (87%) and lower, more variable performance for noncanonical sentences (71%) across English and Mandarin. This work is important as the M-SOAP adds to current tools that SLPs can use to assess the Mandarin sentence comprehension abilities of Mandarin-English biPWA for more effective care.

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## 54 1:00 pm 76

### Exploring the Role of Parental Monitoring and Peer Affiliation in Reducing Delinquency among At-Risk Adolescents

**Liana Parrish, Bachelor of Arts in Psychology (U)**

Adolescents who have experienced adversity, such as abuse and neglect, are at increased risk for delinquent and violent behavior. Risk factors, such as affiliation with deviant peers and exposure to community violence further contribute to delinquency. Protective factors, such as parental monitoring and supervision, affiliation with positive peers, and involvement in extracurricular activities e.g., sports teams, school clubs) mitigate the risk for delinquency. This study aimed to identify factors that alleviate and exacerbate the impact of childhood adversity on delinquency among at-risk adolescents. We hypothesized that parental monitoring, affiliation with positive peers, and involvement in extracurricular activities would mitigate the impact of childhood adversity on delinquency among adolescents, while affiliation with deviant peers and community violence exposure would increase risk. Participants were 1,057 youth and their caregivers who participated in the Longitudinal Studies of Childhood Abuse and Neglect from when youth were born until they were 16 years old. Information about youths' exposure to Adverse Childhood Experiences (ACEs) was collected from prospective youth and parent reports, as well as Child Protective Services records from birth until participants were 14 years old. Parents reported about their parental monitoring, youths' exposure to community violence, and youths' aggressive and delinquent behaviors when youth were 14 years old. Youth reported positive and deviant peer behaviors and extracurricular activity involvement when they were 14 years old, and delinquent and violent behavior when they were 16 years old. Path analyses revealed that, in addition to the direct effect of ACEs on delinquency,  $IRR = 1.07 [1.02, 1.13]$ , there were statistically significant indirect effects of ACEs on delinquency through parental monitoring and deviant peer affiliation. Having more ACEs was associated with less parental monitoring,  $\beta = -.1 [-.16, -.04]$ , which was in turn associated with more delinquency,  $IRR = .81 [.72, .92]$ . On the other hand, having more ACEs was associated with marginally greater affiliation with deviant peers,  $\beta = .07 [0, .14]$ , which was associated with more delinquency,  $IRR = 1.49 [1.34, 1.66]$ . Findings highlight the importance of parental monitoring and knowledge about adolescents' peer groups, particularly for youth who have experienced adversity.

## Session H-2

Behavioral and Social Sciences 2

Friday, March 1, 2024 1:00 pm

Montezuma Hall

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## 474 1:00 pm 7

### Engaging Nursing Students in Service Learning to Understand Rural Communities

**Malia Huff, Bachelor of Sciences in Microbiology (U)**

A service learning experience (SLE) is designed to allow students to apply their knowledge and skills to real world situations while having a bi-directional positive impact in the community. The literature demonstrates that SLEs allow community health nursing students to better understand health issues faced by rural communities, and that students are more likely to return to their community after completing their program. The purpose of this project was to determine the effect of a service learning experience on community health nursing students' understanding of people in rural areas. A cohort of post-licensure nursing students enrolled in an RN-BSN Community Health Nursing course were anonymously surveyed before and after completing an SLE focused on low income populations in unincorporated communities in a rural border region. The pre-survey was designed to elicit their perceptions and past experiences working with low income populations. After completing their SLE, students were administered a post-survey designed to elicit new perceptions or reflections on their experience working with low income populations within the context of a study focused on identifying health literacy and healthcare access practices. These students were better able to recognize individuality and unique circumstances within low income, food insecure populations who reside in geographically challenged communities, and verbalized a better understanding of community needs, including differences in culture and socioeconomic status. This implies that the SLE exposed students to the reality of the barriers faced by individuals in low income and geographically challenged areas, which they may have misunderstood beforehand. This may result in an increased interest by nursing students to practice in the community health speciality while also giving them the knowledge, skills and attitudes (KSAs) to better care for individuals in this unique population.

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## 475 1:00 pm 8

### Youth 4 SDGs: Better Health, Brighter Future! Public Perception, Attitudes, and Behaviors Towards the United Nations Sustainable Development Goals in Youth of San Diego, California and Paris, France

**Lillian Eckoff, BS- Environmental Science (U)**

The Youth 4 SDGs, Better Health, Brighter Future survey is a comparative analysis through the Metabolism of Cities Living Lab at San Diego State University. This study will use the Sustainable Development Goals (SDGs) developed by the United Nations as indicators to compare public perception,

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attitudes, and behaviors in the youth pursuing higher education in North America (San Diego, California) and Europe (Paris, France), especially those regarding the One Health Urban Policy Agenda. In order to evaluate students' command over these topics, a non obligatory online questionnaire was designed and distributed to students in English and French across two university campuses: San Diego State University (SDSU) and l'Institut d'études politiques de Paris (SciencesPo). We are developing research that effectively demonstrates the education, awareness, and behavior change required to succeed in a world affected by continued global issues such as inequality, over consumption of finite resources, and widespread pollution (Fernandez & Maione, 2019). The study's subjects focus on students within higher education bi-nationally as it is ultimately the next generation who will be implementing policies, voting with their money and ballot, and experiencing the consequences of the extent of success of the SDGs worldwide. It is crucial to be able to compare the effectiveness of this knowledge internationally as the SDGs are implemented worldwide with the central promise of leaving no one behind. The findings of this study can inform holistic-health strategies to mobilize and empower youth as active contributors to the global effort to achieve the SDGs.

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#### **476 1:00 pm 9**

##### **Understanding Unregulated Provisioning of Moor Macaques for Conservation Efforts in South Sulawesi, Indonesia**

**Amaru Marchant Simonsen, Environmental Sciences B.S. (U)**

Rapid human development compounded by the increase in wildlife tourism promoting cross-species interactions may pose a substantial threat to primate conservation efforts. The normalization of unregulated, close interactions (i.e. posing for photos) between humans and primates has encouraged the public to engage with protected wildlife - specifically through the act of provisioning - despite potential safety risks and long-term disruptions to species welfare. Provisioning occurs daily along the only road traversing Bantimurung Bulusaraung National Park (TNBABUL) in South Sulawesi, Indonesia where travelers provide food to the endangered, endemic moor macaques whose home range includes sections of this road that is currently under expansion efforts. As part of a 6-week, NSF-funded International Research Experiences for Students program, I studied this human-macaque interface to better understand the potential costs and benefits to each species, and potential motivators to the increase in initiating interspecies interactions by both counterparts. This program involved pre-fieldwork preparation for which I conducted a literature review of previous studies on the impacts of provisioning on primates; 1-week of field training in methods in primate behavioral observation, human dimensions of conservation, and plant phenology; and 1-week of preliminary observations on the human-macaque interface at TNBABUL. I then developed a mini-project on roadside provisioning using the "all-occurrence" method to record the following data on provisioning events: vehicle type, method of provisioning, food type, and demographics of species involved. I conducted

these observations during 30-minute sampling periods from 12:30 - 18:30 across four days in July-August 2023 recording a total of 44 provisioning events. An average of three events occurred during each 30 minute sampling period. 77% of provisioning vehicles were automobiles, specifically SUVs, used as personal or shared vehicles. 37% of the moor macaques partaking in provisions were immature (subadults or juveniles); and 91% of the events involving immature macaques also involved adults. These results suggest that immature macaques may be mimicking adult behavior by eating human food becoming habituated to roadside interactions as they mature. Conservation efforts should be directed to educate the public on the dangers of provisioning and implement necessary regulations to decrease disruptive cross-species interactions.

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#### **477 1:00 pm 10**

##### **Investigating the Neural Dynamics of Face Processing: Comparison of Time-, Time-Frequency, and Frequency-Domain EEG Analysis Methods**

**Dylan Instone, Bachelor of Arts in Psychology (U)**

Electroencephalography (EEG) captures postsynaptic neural currents and can reveal their oscillatory dynamics in real time. Its excellent temporal resolution provides insight into the stages of processing including sensory-based perception, cognitive integration, and response preparation and execution. Due to its oscillatory nature, EEG data can be analyzed using various techniques, which have been instrumental in advancing the fields of neurophysiology and cognitive neuroscience. The overall aim of the current study was to compare the three principal analytical methods by analyzing a sample data set from a single participant acquired during a fast visual stimulus processing task. Pictures of upright and inverted faces and cars did not necessitate a response, making it possible to examine the early stages of visual processing without motor interference. The participant was instructed to press a button to the randomly interspersed images of hand signs. Time-domain (event-related potentials) analysis replicated a well-known N170 peak which was larger to inverted stimuli and was especially prominent over the posterior scalp. The N170 is a recognized signature of the early stage of face processing. Time-frequency domain analysis convolves EEG data with Morlet wavelets to analyze changes in different frequency bands across time. It captured greater event-related theta power (4-7 Hz) to inverted faces over the posterior scalp during early sensory processing. In addition, theta is known to be sensitive to cognitive/attentional processing and was larger to response-relevant hand signs. Similarly, event-related alpha power (8-12 Hz) was greater to attention-capturing hand signs. Beta band (13-25 Hz) is known to be sensitive to motor activity. Beta desynchronization was greater over the left central scalp, indicative of an engagement of the motor cortex contralaterally to the responding hand. Across these frequency bands, the time-frequency analysis provided an excellent metric for the cognitive and motor aspects of stimulus processing. In contrast, the frequency domain analysis utilized a Fast Fourier Transform across the entire epoch and was insensitive to the sensory or cognitive/motor aspects of stimulus processing. Taken together,

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while each of these methods provides unique results, they provide rich and complementary insights into the neural stages of face processing.

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**478 1:00 pm 11**

**An Exploratory Study on the Relationship between Adverse Childhood Experiences and Need for Closure**

**Ingrid Anna Yu, Bachelor of Arts in Psychology (U)**

Adverse childhood experiences (ACE) can severely affect an individual's development and may leave long-lasting cognitive consequences. ACEs may also lead to higher levels of anxiety, higher risk adversity, and a strong desire for predictability. Those with ACEs are more likely to have a higher need for closure (NFC), especially when they encounter additional stress or uncertainty. However, little research has addressed the role of ACEs and NFC, and no known prior studies have examined these areas in university students, a population experiencing the significant life changes that accompany the transition to college and independence. Participants (n = 683) from San Diego State University answered questions from the Adverse Childhood Experiences Questionnaire and the Need For Closure Scale. We hypothesized that the higher number of ACEs (range 0-4+) that an individual experienced would be associated with their NFC classification (low, average, or high). A Chi-Square test was conducted. No significant association between the number of ACEs and NFC was found ( $p=.432$ ). Future research should examine specific types of ACEs experienced, as certain ACEs may play a greater role in predicting an individual's NFC classification.

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**479 1:00 pm 12**

**Intersecting Identities: Empowerment through Undergraduate Autoethnographies**

**Emily Christina Le, Bachelor of Arts in Psychology with an emphasis in Neuroscience (U)**

This research aims to bring forth the experiences of five undergraduate underrepresented students navigating higher education. Three scholars gained research experience in a federally-funded, eight-week summer research seminar called the Health Careers Opportunity Program (HCOP) while two scholars were first introduced to the research process in San Diego State University's College of Education's Faculty-Student Mentoring Program (F-SMP). Although we are in different stages of our research experience, we focus on a qualitative research method called autoethnography. Our narratives aim to help contest the dominant narrative within higher education. We expose the predetermined expectation behind the romanticized American college dream; which we define as the freedom and ability to pursue higher education as a form of upward mobility towards a successful career.

Our experience writing autoethnography engaged us in writing workshops that allowed us to have an open discussion about our narratives through HCOP in the summer of 2023 and we've continued to work on this in F-SMP under the guidance of Dr.

Park. The research employs autoethnography as a qualitative methodological tool, allowing us to reflect on lived experiences and draw connections between personal stories and scholarly insights. By engaging in self-reflexivity and introspection, we question and critique systems of power that aim to oppress us. We utilized the narrative research approach to explore college culture, systemic barriers in higher education and the unique perspectives stemming from our underrepresented, nontraditional backgrounds.

Through this process, we navigate and articulate the complexities of our identities, examining how our cultural backgrounds impact our academic pursuits, social interactions, and overall sense of belonging in an institution not designed for us. This collection of autoethnographies serves as a means for personal expression and invites others to explore their positionality.

We expect our preliminary findings to be contextualized within cultural studies and educational frameworks, offering significant insights into the challenges and accomplishments of navigating higher education as disempowered college students.

Ultimately, these autoethnographies offer a counter-story narrative framework for empowerment and social justice. Our collaboration exemplifies the potential for shared narratives to foster understanding, challenge stereotypes, and inspire others within and beyond the academic community.

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**480 1:00 pm 13**

**Are There Differences in Motivation of Engagement in Services between Latino and Non-Latino Caregivers?**

**Brianna Maldonado, Child and Family Development (U)**

Early intervention (EI) services have proved to be of significant benefit in the lives of children with ASD (Sriharan et al., 2018). A major component of effective EI services during early childhood is parental involvement, with children demonstrating increased developmental progress when parents play an active role in intervention (Zigler & Muenchow, 1992). However, evidence suggests that parents' involvement in their children's services can be influenced by demographic factors, such as their socioeconomic status and race/ethnicity. For example, children from low-income households typically receive fewer hours of treatment than children from more affluent households (Khetani, et al., 2017). This project aims to compare the self-reported motivation beliefs to engage in early intervention services for children with autism between Latino and non-Latino caregivers. Data for this study were drawn from a community-based clinical trial occurring with Early Intervention services for young children with autism. Caregiver Motivation was measured using a questionnaire which was adapted from a brief rating scale called the Parent-Motivation Inventory (PMI; Nock et al., 2006). Subscales include: Desire for child change, readiness to change parenting behavior, and perceived ability to change parenting behavior. The PMI provides a reliable method for assessing parents' motivation to participate in services and has implications for predicting barriers to treatment participation (Nock et al., 2006). Multivariate Analysis of Variance (MANOVA) analysis was used to compare the average scores on the

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total and three individual subscales of the Parent Motivation Inventory between Latino and non-Latino caregivers. No statistically significant differences were found between Latino and non-Latino caregivers within each subscale. Therefore, results showed that there were no statistically significant differences between Latino and non-Latino parents in their motivation to be involved in their children's services. Although there weren't significant differences found in this study other factors that were unaccounted for such as, socioeconomic status, lack of accessibility to services, formal education level, could potentially influence these results in future studies.

## Session H-3

Biological and Agricultural Sciences 1

Friday, March 1, 2024 1:00 pm

Montezuma Hall

**481 1:00 pm 14**

Species richness does not predict phylogenetic or functional diversity in managed grassland plant communities

**Alec Juliano, Bachelor of Science in Biology with an Emphasis in Ecology (U)**

Promoting biodiversity is a primary goal of many habitat restoration and management projects because biodiversity can support ecosystem function and stability. Biodiversity is often measured as species richness, but other indices, such as phylogenetic diversity or functional trait diversity, may be more informative. It is often assumed that taxonomic, phylogenetic and functional diversity are positively correlated, but the relationships among these three dimensions of biodiversity may be inconsistent across different ecosystems. In this study, we used taxonomic, phylogenetic, and functional trait data to investigate diversity relationships in grassland plant communities. Surprisingly, neither phylogenetic diversity nor functional diversity was highly correlated with species richness. These findings have implications for future land management and restoration projects. Land managers may seek to promote functional and phylogenetic diversity in restored plant communities because of their potential to support ecosystems. However, simply adding plant species into a community regardless of their evolutionary history or traits is unlikely to accomplish this goal.

**482 1:00 pm 15**

Aquatic Toxicological Assessment of Electronic Tobacco Products: Hazardous to California Wildlife

**Elora Shakoor, Bachelor of Science in Public Health (U)**

Hot tobacco products (HTPs) and electronic nicotine delivery systems (ENDS) are nicotine-containing products that are readily available for mass consumption. Since the distribution of these products, they often wind up in aquatic environments and lead to nicotine contamination in waters. This subsequently

leads to developmental deformities and disruption of gene expression and regulation in organisms exposed to these toxic chemicals. The goal of our experiment was to assess the toxicity of chemical leachate from HTPs and ENDS and see how it affects the health and development of aquatic life. To test this theory, we used *Danio rerio*, or zebrafish, as our model organism to conduct this experiment. Our methodology included exposing the fishes to diverse concentrations of HTP/ENDS/cigarette solutions (0%, 25%, 50%, or 100%) from 0 days post fertilization (dpf) to 4 dpf and microscopy of the exposed fishes facilitated in quantifying hatching and mortality rates from days one through three. Due to elevated mortality at all concentrations, we added lower concentrations (1%, 5%, 10%, 15%). There were still high levels of impaired hatching, pericardial edema, yolk sac edema, and spinal deformities in the 5%, 10% and 15% groups, so a concentration of 2.5% was used for RNA sequencing since it is sublethal. We concluded that mortality was elevated when fishes were exposed to ENDS compared to those exposed to HTPs and conventional cigarettes. We expect RNA sequencing results to show enhanced xenobiotic metabolism. Overall, ENDS tend to be more toxic than other smoking alternatives and impair embryonic development.

**483 1:00 pm 16**

Factors required for Nuclear Pore Complex Rejuvenation in *Drosophila* Oogenesis

**Tram Nguyen, Bachelor of Science in Biology (U)**

The nucleus plays a critical role as a control center of a eukaryotic cell as it contains cellular genomes. The nucleus is enclosed by the nuclear envelope, separating its contents from the cytoplasm. Embedded in the envelope are nuclear pore complexes, which function as a selective barrier to regulate the entry and exit of proteins and RNAs, controlling nucleocytoplasmic transport, regulation of gene expression and cellular signaling. The nuclear pore complex (NPC) is composed of around 30 different components, called nucleoporins (NUPs), which are highly conserved across eukaryotes. Together with nuclear lamina and nuclear matrix, NUPs help maintain the shape and integrity of nuclei and organize the genetic material. Dysfunction of NPCs and mutations in NUPs are linked to neurodegenerative and cardiovascular diseases, and to cancer. Despite their importance in these aging-associated diseases, little is known about how NPCs and NUPs are maintained and turned over. Learning such mechanisms of NPC rejuvenation can help in prevention of aging-associated disease, particularly neurodegenerative conditions. Our research investigated mechanisms of NPC turn-over using the model of *Drosophila* oogenesis. Oogenesis has built-in mechanisms for rejuvenation of cellular components because it must generate an oocyte that will become the next generation. We and others have identified striking NPC depletion during the early stage of *Drosophila* oogenesis, marked with an early differentiation marker Bam. This depletion, which we detect by immunofluorescence co-staining and microscopy imaging of NPCs and Bam, is indicative of active removal of NPCs as the initial step of their turn-over. Using oogenesis-specific RNA interference, we

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knocked down candidate genes to determine which of them can rescue the observed NPC depletion and thus regulate NPC turn-over. Previous research has shown that the ESCRT-III/VPS4 complex contributes to NPC turn-over in yeast and in *Drosophila* models of ALS/FTD. In agreement with this work, we identified a specific component of ESCRT-III/VPS4, downregulation of which can rescue NPC levels. In the future, we plan to knock down additional genes that code for ESCRT-III proteins, NUPs, and other candidate factors to test their effects on NPC depletion and in this manner, decipher mechanisms that regulate NPC rejuvenation.

**484 1:00 pm 17****Understanding the Effects of Chemotherapy on a Fibroblast Cell-Derived Matrix****Mena Shammas, Bachelor of Science/Microbiology (U)**

Ovarian cancer is the deadliest gynecological cancer in the United States where over 80% of patients have tumor relapse and no longer respond to chemotherapy. Current research suggests that recurrent ovarian cancer could be due to the existence of a small population of cancer stem-like cells (CSCs) that exist within tumors. These CSCs are drug-resistant and have long-term self-renewal properties, making chemotherapeutic drugs unsuccessful at eliminating them. It is thought that these cells are able to reinitiate tumors following chemotherapy, making it important to study the tumor microenvironment that supports their survival post-chemotherapy. Our previous research has found that ovarian CSCs strongly depend on signaling factors that are enriched in the tumor microenvironment to survive and that chemotherapy treatment enhances the secretion of these factors from non-cancer cells such as fibroblasts. Fibroblasts secrete an extracellular matrix (ECM), a network of proteins and polysaccharides that provides a physical scaffold around cells. This deposition of ECM has been implicated in the survival of CSCs. We hypothesize that chemotherapy activates fibroblasts and enhances the secretion of key ECM components: fibronectin (FN1), collagen (Col1a1), and vitronectin (VN) from fibroblasts that help CSCs attach and survive. Generating fibroblast-cell derived matrices (fCDMs) with murine fibroblast line 3T3 under chemotherapy resulted in fCDMs with significant increases of fibroblast activation marked by actin-smooth muscle ( $\alpha$ -SMA), FN1, and trending increases of Col1a1, and VN. Ongoing studies will apply siRNA knockdown to fCDMs to reduce these key ECM components enriched by fibroblasts after chemotherapy and test changes in the ability of CSCs to attach and survive. These fCDMs will be decellularized and re-plated with ovarian cancer CSCs expressing membrane marker CD117 (c-kit) to test adhesion and survival. These studies will be supplemented with an ex-vivo model using decellularized mouse peritoneums treated with chemotherapy to test and confirm our fCDM model. This study will provide insight into the ongoing evolution of ovarian tumors under chemotherapy and how the ECM generated by fibroblasts affects the survival of CSCs.

**485 1:00 pm 18****Soil Temperature Profile Exploration of Thermokarst Features****Kristine Bernabe, Biology, Emphasis in Ecology, B.S. in Applied Arts and Sciences (U)**

Climate change-induced warming has led to permafrost thawing in the arctic. The degradation of permafrost is a major contributor to greenhouse gas emissions and has widespread impacts on arctic hydrology, biogeochemistry, and ecology. The formation of cryoturbated features, a consequence of permafrost degradation, further exacerbates these impacts by altering landscapes and soil heat conductance. Despite the well-established link between climate change and permafrost thawing, the considerable variability in soil thermodynamic properties related to cryoturbation is not well understood. This study addresses this gap by examining temperature profiles in vegetated and unvegetated cryoturbated features. In Utqia viik, Alaska, during the summer of 2023, the temperature profile of vegetated and unvegetated cryoturbated features were measured over three days (7/21, 8/4, 8/5). A probe with 14 thermocouples attached with a depth spanning from 2.5 cm to 35 cm was used to measure temperature data every 2.5 cm. Additional environmental data included soil moisture, thaw depth, photosynthetically active radiation, air temperature, and wind speed. Preliminary results indicate a consistent trend of unvegetated cryoturbated features exhibiting higher temperatures, especially near the surface, compared to vegetated sites. These unvegetated sites also generally demonstrated deeper thaw depths. These initial findings demonstrate that unvegetated cryoturbated features might be particularly vulnerable to permafrost thawing and degradation, which may result in increased respiration and release of greenhouse gasses. While preliminary findings provide valuable insights, further research is essential to uncover the factors driving this vulnerability and to assess its broader impacts, especially as it relates to climate change.

**486 1:00 pm 19****Fetal Pancreatic Genetics in Lipogenesis and Type 2 Diabetes through Fetal Epigenomics****Aneesa Mahmood, Biology (U)**

Excessive lipogenesis, leading to fat accumulation, can influence insulin dynamics as it induces insulin resistance, characterized by decreased cell responsiveness to insulin, which necessitates increased insulin production by the pancreas. The increased insulin production, driven by the demand to overcome insulin resistance, may potentially lead to genomic changes in the insulin and insulin receptor genes, which can, in turn, affect the regulation of insulin signaling pathways. These genomic alterations, combined with insulin resistance, can contribute to the pathogenesis of type 2 diabetes by disrupting the fine-tuned genetic balance required for effective insulin metabolism and glucose regulation.

The primary objective of this research project is to elucidate whether fetal pancreatic genetics play a pivotal role in the development of lipogenesis and its association with type 2

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diabetes by inducing alterations in fetal epigenomic patterns. To achieve this, we employ a dataset of chromatin accessibility Quantitative Trait Loci (caQTLs) derived from pancreatic progenitor stem cells (PPCs), which have been shown to fetal-like pancreas molecular profiles. This research is essential in comprehending whether genetic variants influencing chromatin accessibility in fetal pancreatic cells contribute differently to T2DM risk compared to adult pancreatic cells. The unique nature of these caQTLs suggests their potential influence on chromatin accessibility during the critical early stages of pancreas development.

**487 1:00 pm 20**

### 16S Microbial Alpha Diversity's Negative Effect on Relative Growth Rates on US and Non-US *Humulus lupulus* L. cultivars

**Nathan Bingham, Bachelors of Science in Biology (U)**

Agriculture is an arguably vital cornerstone for human civilization and amidst growing populations, climate change, and water scarcity, agricultural research is an imperative field to generate new solutions for the constant issue of supplying food. New and improved farming techniques as well as genetically advantageous plant traits are being artificially selected for: a process known as plant domestication. The domestication of useful food crops is globally utilized with the preferred method of domestication being cultivar generation. Cultivars are species that come about after generations of artificial selection by humans for favorable traits. Thus, cultivars evolve with a reliance on human intervention in order to grow, making them differ significantly from their wildtype ancestors. From this domesticating process, the rhizospheres of said cultivars will also begin to distance themselves from those of their wildtype ancestors and may lose mutualistic relationships with microbes traditionally established by their counterparts. Rhizosphere is the mutualistic community of microbial species established by a plant which allows them to acquire resources better. There are many examples of cultivars used globally to fulfill food demands, especially in the US; staples like corn, wheat, and soy are all cultivars. Luxury crops are also subject to similar treatment of artificial selection including tobacco, coffee, and hops. The experiment discusses the differences between the rhizospheres of U.S. based and non-U.S. based cultivars measured against their relative growth rates all within a common garden setup.

**488 1:00 pm 21**

### Removal of Sulfamethoxazole with a Novel Modified Anaerobic Baffled Reactor

**Shiloh Bolden, Bachelor of Science in Environmental Engineering (U)**

The degradation of sulfamethoxazole in wastewater treatment systems prevents the breeding of antibiotic-resistant bacteria and limits its bioaccumulation in the environment. Sulfamethoxazole (SMX) is an ammonium-based antibiotic used to treat infections. Antibiotics inherently kill microbial communities that are used in wastewater treatment systems

which makes SMX found in wastewater especially difficult to degrade. There is notably a gap in the understanding of how to treat SMX in anaerobic baffled reactors, a commonly used decentralized treatment system typically used in rural areas. The ABR has the benefits of low energy costs and low maintenance. The anaerobic biodegradation of organic constituents caused by the sludge blanket makes for efficient treatment with low sludge production but does not remove ammonium-based compounds. In this study, we modified an anaerobic baffled reactor by adding fine bubble aeration to stimulate the growth of a mixed consortium of nitrifiers and anaerobic ammonium oxidizing bacteria (anammox). Due to anammox's ability to degrade ammonium, we hypothesize that this system has the ability to also degrade SMX. These results will provide insight into the effectiveness of a decentralized treatment system's ability to degrade a commonly used drug that promotes the spread of harmful antibiotic-resistant bacteria.

## Session H-4

Biological and Agricultural Sciences 2

Friday, March 1, 2024 1:00 pm

Montezuma Hall

**489 1:00 pm 22**

### Site-directed mutagenesis and Kinetic analysis in the IDH1 enzyme

**Darius Hyde, Chemistry with an Emphasis in Biochemistry (U)**

Isocitrate dehydrogenase 1 (IDH1) is an enzyme found in the cytoplasm and peroxisomes of cells that converts isocitrate into alpha-ketoglutarate. Mutations in the IDH1 enzyme are known to cause several types of cancer. These changes to the IDH1 active site residue R132 prevent the enzyme from catalyzing its conventional reaction and instead lead to a neomorphic activity that generates high quantities of the metabolite 2-hydroxyglutarate (2-HG) that can disrupt regular cellular functions and promote the growth of cancer. We don't currently know which amino acids drive the catalytic steps in the conventional and neomorphic reactions. Here, I sought to analyze the activity of a specific mutant in the IDH1 enzyme that I designed to probe the overall catalytic functionality of the enzyme. I designed and generated IDH1 mutations using site-directed mutagenesis. I then catalytically characterized IDH1 K72M, which mutates an active site lysine that is essential to catalysis in *E. coli* forms of IDH1 but whose function is not yet known in human IDH1. I hypothesized that K72 interacts with NADP<sup>+</sup> to promote the hydride transfer step, and mutation of this residue will stabilize and protonate an oxyanion; while maintaining the positive charge at N1, this would facilitate hydride transfer. I used steady-state kinetic experiments to analyze the activity of the protein. I found that the K72M IDH1 mutant had no catalytic activity, validating that K72 is a critical residue for catalysis. Ultimately, this work is crucial because it answers the questions that we have about the functionality and activity of the IDH1 enzymes, as well as closes the knowledge gap about the missing details of the general reaction and discovers which residues are involved.

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**490 1:00 pm 23****Purification of Microtubules to Understand Mechanism of Protein Chaperone UNC-45****Esmeralda Salcedo, Biology, Emphasis in Cellular and Molecular Biology, B.S. in Applied Arts and Sciences (U)**

The protein UNC-45 has been found to play important roles during the development, differentiation, and repair of several different cell and tissue types. However, with a structure and sequence that doesn't reveal any known catalytic functions, it's hypothesized its molecular mechanism of action is driven via protein-protein interactions. There is a short list of confirmed protein interactors for UNC-45, which includes microtubules, but the structure formed from the interaction is unknown. In an effort to understand the mechanism and the interaction, we need to study its structure when UNC-45 is in complex with the microtubules by starting with the purification of microtubules. The literature has demonstrated microtubule can be purified through a series of chemical treatments or temperature treatments. To maximize the purification of microtubules from the acquired small mouse brain, we attempted purifying via a combination of chemical and temperature treatments. Overall, our work found the most productive form of purification to be through treating mouse brains with temperature treatment only to isolate microtubules, as opposed to a combination of both treatments. We believe the conditions were too ideal for microtubule polymerization to the point where it promoted catastrophe – the complete and sudden breakdown of the microtubule structure. We are in the process of using transmission electron microscopy to visualize the structure formed when UNC-45 is in complex with microtubules. This will yield more insight regarding UNC-45 interactions with microtubules and its mechanisms of action.

**491 1:00 pm 24****Fluorescence Spectroscopy: A Rapid, Cost- Effective Method of Photo-Resistance Determination****Ryan Spaulding, Bachelor of Science in Environmental Engineering (U)**

Tire wear particles (TWP) pose a substantial threat to ecosystem health, as these tiny, abraded particles are washed away from roads and leach organic compounds into urban waterways. Many of the leached compounds are toxic, and pose health risks to plants and animals alike. Fluorescence spectroscopy measures the fluorescent signatures of compounds, and is a rapid technique to track the decay rates of the tire wear-derived compounds in water when exposed to sunlight. It has a distinct advantage over other techniques that are more time consuming and expensive. Based on the tendency for sunlight to photo-oxidize compounds with more humic and aromatic structures, we hypothesize that photo-labile TWP compounds will have dominant fluorescence peaks in humic-like regions A and C, whereas more photo-resistant TWP compounds will have peaks in the protein-like fluorescence regions T and B. This information, if the hypothesis is substantiated by further experimentation, can be used to determine which

compounds will persist and which will degrade when exposed to UV radiation based on their fluorescence peaks. In order to confirm this hypothesis, photo-resistant and photo-labile compounds known to leach from TWP were prepared in water or solvents, and three-dimensional fluorescence spectra were acquired for both types of compounds. Preliminary results indicate that 4 photo-labile compounds, such as 6PPD, the precursor to the well known compound 6ppd-quinone, which has been linked to fish mortality in pacific northwest streams, all had peak excitation wavelengths > 300 nm and peak emission wavelengths > 400 nm, which thus far confirms the hypothesis. Only light absorbing compounds can undergo direct photolysis, and we expect that many of those will be fluorescent and amenable to this method. Yet, one limitation is that non-fluorescent compounds may be missed. Nevertheless, matching the photochemical degradation of organic compounds to their fluorescent peaks may serve as a rapid tool to screen the persistence of a solute when exposed to sunlight, and, in turn, its persistence in the environment.

**492 1:00 pm 25****Mobile Farmers Market****Nyla McGlory, Bachelor of Social Science (U)**

Southern San Diego residents experience a lack of access to affordable, fresh, organic produce. With a lack of funding and infrastructure, Southern San Diego has had to find alternatives to meet the needs of the community. Project New Village's Mobile Farmer's Market is the first of its kind in South San Diego. As its namesake suggests, the Mobile Farmer's Market presents as a food truck, but instead of the usual food, the truck presents fresh, organic, and locally grown fruits and vegetables. Although truck prices are already less expensive than their grocery store counterparts, SDSU's partnership with the truck has allowed for customers to get \$10-15 worth of product for free after a quick nutrition education session and the completion of a survey. As SURP students, we were responsible for creating nutrition education about the available produce, educating participants for sessions, and conducting the surveys. Building community and gaining trust from vulnerable populations that have historically been exploited was another aspect we considered and kept in mind always. Creating relevant and accessible nutrition education, in English and Spanish, and then successfully bringing it to the community was one of the key aspects of our work. Intergenerational and culturally sensitive interactions and communication were major aspects of each market to creating lasting impact for the Market and other community events.

**494 1:00 pm 27****Isolation of Polar Trifluoroborates****Dina Shehadeh, bachelors of science in biochemistry (U)**

Organotrifluoroborates are one of the essential reagents in organic synthesis and medicinal chemistry. These compounds are air-stable, easily stored and handled. They can be used in both metal-catalyzed and non-catalyzed reactions forming carbon-carbon and carbon-hetero atom bonds. Recently,

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we published a method to form these terminal functionalized trifluoroborate salts, making them available. In this work, we report a more efficient method to isolate the small polar trifluoroborates. While these reagents are important, the development of new applications to bond forming reactions are essential. Preliminary results in the reductive alkylation of benzoquinone and 1,4-additions to methyl vinyl ketone using these materials will be presented. Both of these reactions demonstrate transfers of functionalized organic groups in the first of their kind reactions.

## Session H-5

Physical and Mathematical Sciences 1

Friday, March 1, 2024 1:00 pm

Montezuma Hall

**495 1:00 pm 28**

Compression Response of Honeycomb Cores having Sinusoidal In-Plane Waviness Imperfections in Cell Walls

**Shalayah-Naomi Webb, Aerospace Engineering (U)**

Sandwich composite structures with honeycomb cores are used in aerospace structures due to its lightweight and high bending stiffness properties. However, they are prone to impact damage, that although are barely visible, can significantly affect safety. Understanding the flatwise compression response of sandwich composites is therefore important. Honeycomb core manufacturing introduces geometric imperfections (shape deviations, cell wall waviness) to the hexagonal lattice of the honeycomb core that affect its compression response.

This study investigates in-plane waviness of cell walls on flatwise compression. Within the repeated hexagonal cells, individual facets have different thicknesses and develop waviness imperfections of different shapes and amplitudes. Previous imaging studies confirm that these imperfections can be accurately represented by sinusoidal shapes. This parametric study of buckling of honeycomb cores uses a double Y-shaped repeating unit cell (RUC), and varying imperfections: waviness, half-wavenumbers, amplitude for the single thickness branched segments and the central double thickness region.

Python scripts generated geometry models of a RUC with prescribed sinusoidal in-plane wavy imperfections. The amplitude and number of half-waves for each imperfection can be varied. RUCs imperfections include amplitude of one and two wall thickness, and one or two half-waves. These models were meshed and analyzed using Abaqus Finite Element Analysis software. Linear buckling analyses were performed to quantify effects of the imperfection amplitudes and wavenumbers on the buckling load of the RUC.

The RUC of honeycomb cores without imperfections were found to have the lowest buckling load compared to cases analyzed with sinusoidal, in-plane wavy imperfections. Compared to the case without imperfections, the imperfection

case with an amplitude of one wall thickness and one half-wave in all walls increased the buckling load by 45%, and the case with the highest imperfection of an amplitude of two wall thicknesses and two half-waves increased by 80%.

This study contributed to development of scripts for automating model generation and finite element analysis. Preliminary linear buckling analysis shows cell walls interacting during buckling. It is well known in buckling of branched plates and shells that the interactions can lead to nonlinear behavior. Future work will perform nonlinear analysis with geometric and material nonlinearity.

**497 1:00 pm 30**

Precipitation Effect on Groundwater Chemistry in the Angelo Coast Range Reserve

**James Abbott, Geography (U)**

As we anticipate continued climate change in California with patterns of "weather whiplash," concerns arise about the state's water supply. The high precipitation in the 2022-2023 wet season following the 2020-2022 drought period raised interest in how water chemistry relates to precipitation. To investigate the mechanisms of hillslope fluid flow and associated chemical changes, a series of wells in transect along Rivendell Hillslope, located in Angelo Coast Range Reserve, were sampled for water chemistry during the dry season of 2023. The samples were tested for hardness, alkalinity, and major ion concentrations then compared to previous years to understand the relationship between precipitation volume and groundwater chemistry. Comparing field test results, including hardness and alkalinity, between years showed a clear difference between wells located at the top and bottom of the hillslope. Additionally, major ions revealed that, overall, concentrations of major ions decreased between 2022 and 2023. This may be a result of the extreme precipitation between the years causing a decrease in ion concentration. These findings suggest that high precipitation causes a dilution of concentrations of major ions within the hillslope.

**498 1:00 pm 31**

The Catalytic Effects of Intercalation of Transition Metal Atoms into Metallic Molybdenum Disulfide

**Gabriella Trulson, Chemistry (U)**

In catalysts, active sites are atomic sites that facilitate catalysis, lowering the activation energy of reactions. Confinement of single atoms within active site microenvironments has been shown to increase catalytic performance by altering the electronic states of active sites. Using hydrogen evolution (HER) as the model reaction, we studied changes in the catalytic activity of metallic molybdenum disulfide (1T-MoS<sub>2</sub>) by intercalating metal single atoms with varied d-orbital occupations within the catalyst's interlayer spacing. In this work, we intercalated transition metal ions: scandium (d0), manganese (d5), and zinc (d10). Comparing these three cases yields the following results: Intercalation of Zn with fully occupied d orbitals (Zn SAs/1T-MoS<sub>2</sub>) produced the lowest overpotential (179 mV vs. RHE) which in turn yields

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the best HER activity. Intercalation of Mn with half filled d orbitals (HS Mn SAs/1T-MoS<sub>2</sub>) resulted in the lowest charge transfer resistance, which in turn best improves HER kinetics. Intercalation of Zn with fully occupied d orbitals (Zn SAs/1T-MoS<sub>2</sub>) exhibits the highest stability of all three cases (14 mV increase in overpotential after 3,000 cycles). The d0 case (Sc 1T-MoS<sub>2</sub>) yielded the worst activity and stability overall, which is likely due to its inability to donate electrons to 1T-MoS<sub>2</sub> active sites and enhance HER kinetics accordingly. Altogether, these results indicate that the confinement of transition metal ions with fully occupied 3d orbitals had the greatest impact on catalytic activity. Since confinement effects have been recognized for their importance in heterogeneous, homogeneous, and enzymatic catalysis, the knowledge acquired from this research will benefit all types of catalysis.

**499 1:00 pm 32****Creatinine Analysis through Schirmer Strips and Capillary Electrophoresis****Carly Nichols, Bachelor of Science in Chemistry (U)**

Schirmer strips are a filter paper based product that uses capillary action to collect tear fluid. While commonly used for dry eye diagnosis, the strips have been found to be a reliable and inexpensive method of extracting analytes from the eye. Tear fluid is an underutilized bodily fluid that contains a wealth of biomarkers, one of which is creatinine. The purpose of this research is to explore the potential for expanding tear-based diagnostic testing to testing for creatinine, which would present a more accessible alternative to presently available creatinine testing through either blood or urine samples.

Creatinine is a waste byproduct of creatine and often used as a marker of organ function. A low amount of creatinine can indicate issues with liver function or malnourishment, while a high amount can indicate poor kidney function. To test this, we will use capillary electrophoresis (CE) to analyze the tear fluid collected with Schirmer strips. Initially, we used a stock solution of creatinine to test methods of elution for accuracy and reproducibility. This was done by placing a Schirmer strip into a vial containing the stock creatinine solution, allowing it to soak to a certain level, removing the strip from the solution, and then selecting a portion of the strip to analyze. Solution from this segment of the strip is desorbed through the use of an extraction buffer and centrifugation. The next steps of this process will be to test real tear fluid samples and compare the consistency of the creatinine found in those samples to that of the creatinine found in blood samples. Consistency of creatinine in tears would allow for potential expansion of tear fluid analysis to other biomarkers. This poster will present our preliminary results comparing tear fluid creatinine levels to blood creatinine levels in order to determine whether or not tear fluid is a comparable medium for diagnostics.

**500 1:00 pm 33****Effects of Non-native Vegetation on Fires in the Urban Mediterranean Systems****Shruti Gokhale, Environmental Engineering/Bachelor of Science (U)**

This research topic builds upon previous work that investigated the effects of native and non-native vegetation on fire regimes in urban Mediterranean riverine systems in southern California. We will highlight five fires with invasive vegetation cover and five without invasive vegetation cover that occurred between 2000 and 2010. These fires are less than 40 km<sup>2</sup> and near areas of high urban housing density. We will also include the 2018 Del Cerro brush fire in San Diego as a case study. We will utilize geospatial information about fire characteristics and vegetation conditions, such as the normalized burn ratio (NBR) and normalized difference vegetation index (NDVI), to analyze seasonal and annual changes before and after the fires. We will also incorporate parameters such as wind speed, precipitation, and relative humidity into the analysis of the effects of non-native vegetation on fire patterns.

**501 1:00 pm 34****Seedless, One-Pot Synthesis of Near-Infrared Absorbing Silver Nanotriangles****Alyse Purdy, Bachelor of Science in Chemistry (U)**

Several applications of metal nanoparticles rely on these materials' unique optical properties, which can be tuned by altering the size and shape of the nanoparticles. A number of reports in literature describe and break down methods of synthesizing, for example, triangular silver nanoplates of varying size. Many of these methods involve several steps, with the first being the synthesis of small silver nanospheres ("seeds"), which can then be modified in following steps. In our study, we report a reproducible, seedless, one-pot synthesis of silver nanotriangles that can absorb light from the ultraviolet to infrared regions of the spectrum. Utilizing the oxidative, etching power of H<sub>2</sub>O<sub>2</sub>, as well as the chemical reduction of silver ions in the presence of trisodium citrate and sodium borohydride, we can produce silver nanotriangles capable of absorbing in the near-IR range. By varying the concentration of silver ions, we are able to control the size of the nanoplates, thus controlling the wavelengths of light at which the particles absorb. To further analyze characteristics of the nanoplates, UV-Vis spectrometry and dynamic light scattering (DLS) was used. With our seedless, one-pot approach, we can create a reproducible spectrum of silver nanotriangles possessing differences in shape, size, and optical properties.

**Session H-6**

Physical and Mathematical Sciences 2

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**502 1:00 pm 35****UV-Based Optical System for the Fluorescence and Detection of Oceanic Oil Spills****Alexander McLintock, Bachelors of Science in Physics (U)**

This research project has been a collaborative research project between InterOcean Systems, LLC, and San Diego State University addressing the environmental & economic impact of

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oceanic oil spills. The primary objective of this collaboration is to develop an early detection optical system of oil spills on the ocean surface, preventing unnecessary damage done to the ecosystem and minimizing economic losses.

Our proposed solution is a long-range, fluorescent-based optical system. Where the detector shines UV (ultraviolet) light onto the ocean surface, the oil-slicked surface will fluoresce back into the detector, signaling a positive reading. UV LED's have recently become more affordable and effective, making them the prime choice for the project, as opposed to more expensive lasers used by most other similar products.

Zemax OpticStudio was used to design the necessary optical components and their position to create the most practical and efficient system. Through a combination of computer modeling and experimental measurements, a UV projection and oil detection system consisting of two telescopes, a UV LED, various filters, lenses and detectors laterally attached to the telescope were created.

We've rigorously tested the system with various oil samples in both well-lit and low-light environments. We were also able to successfully detect a square meter of oil from a target distance of 60 meters with remarkably high signal to noise ratios, including in daylight conditions. In this presentation, we will delve into the key features of our prototype's design while also sharing our most recent results.

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### 503 1:00 pm 36

#### A Computational Study of Hydridic Hydrogen Bonds

**David Roberts, Chemical Physics (U)**

Hydridic hydrogen bonds are a new type of hydrogen bonds that were proposed recently in literature. We used  $\text{Me}_3\text{Si-H}\cdots\text{Y}$  model complexes ( $\text{Y} = \text{ICF}_3, \text{BrCN}, \text{K}^+, \text{and HCN}$ ) containing a hydridic hydrogen as the main systems in this study. These Y groups all contain a less electronegative atom or sigma-holes, which can interact favorably with the Si-H bond where the hydridic hydrogen atom is negatively charged (hydridic) and the Y group is positive. To shed light on the physical origin of the hydridic hydrogen bonds and their differences from the normal (protonic) hydrogen bonds, we employed energy decomposition analysis methods using a common basis set def2-TZVPPD while comparing two different density functionals (wB97X-V and B3LYP-D3(BJ)). The EDA results for model complexes between  $\text{Me}_3\text{SiH}$  (the H-donor) and  $\text{ICF}_3, \text{BrCN}, \text{K}^+$  and  $\text{HCN}$  show that (i) there is a much more significant role of dispersion interaction in the formation of hydridic hydrogen bonds than in normal hydrogen bonds; (ii) the predominant direction of charge transfer is from X-H to Y, which is reversed compared to the protonic Hydrogen Bonds. In addition, The Si-H vibrational frequency is red-shifted compared to that in the monomer, which, as suggested by the results of adiabatic EDA show that it is primarily due to charge transfer. These findings led us to conclude that an addition of non-classical hydridic and dihydrogen forms to the IUPAC definition of hydrogen bonding should be considered since they have both commonalities and distinctions from the conventional hydrogen bonds.

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### 504 1:00 pm 37

#### Photochemical production of silver nanoparticles in the environment via reduction of silver ions by humic acid and fulvic acid

**Peyton Alvarez, Bachelor of Science in Chemistry with an Emphasis in Biochemistry (U)**

This study focuses on the ability of silver ions and both fulvic and humic acids to form silver nanoparticles in the presence of UV and visible light. Silver nanoparticles have a number of commercial and consumer applications due primarily to their antimicrobial properties. Because of these applications, silver ions and silver nanoparticles enter waterways, and thus, the environment. Unfortunately, these species can directly disrupt sensitive ecosystems by harming bacteria. As silver ions and nanoparticles are photoreactive, the question arises of how they will react in the environment when exposed to sunlight.

As our data show, silver nanoparticles can form from the photoreduction of silver ions by fulvic and humic acids, two classes of compounds that result from the breakdown of plants and animals. Additionally, work from our group and other groups shows that iron plays a role in the photoreduction process. In our work we expose solutions of silver ions, fulvic and humic acids, and iron salts to UV and visible light, and monitor changes in the solutions using UV-visible absorption spectroscopy and dynamic light scattering (DLS). In order to better understand the growth mechanism of the resulting nanoparticles, we investigate the effects of reactant concentrations and pH.

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### 505 1:00 pm 38

#### Electrochemical evaluation of solvents for analysis of $\text{Mn(II)(Pybox)Cl}_2$

**Max Root, Bachelor of Science in Biology with a focus in Cellular and Molecular Biology (U)**

First-row transition metal complexes are of particular interest for use in electrocatalysis due to their relative abundance, affordability and lower environmental impact over traditional metal catalysts.  $\text{Mn(II)(pybox)Cl}_2$  is one such complex identified as a suitable candidate for electrocatalytic processes. Here, we aim to employ electroanalytical techniques to characterize the mechanism through which it may induce organic radical species from alkyl halides to participate in coupling reactions. Utilizing cyclic voltammetry and electrochemical impedance spectroscopy, the effect of several polar aprotic organic solvents (including acetonitrile, dichloromethane, dimethylformamide and tetrahydrofuran) on the electrochemical system's electron transfer capacity were examined. Each solvent was selected based on preexisting data suggesting high solvating ability, electrochemical inactivity and desirable electrochemical limit. Solvent attributes such as polarity and coordination ability were evaluated to better understand the relationship between the complex and its chemical environment, therefore gauging the compound's stability both intrinsically and during electron transfer. Through this methodology, it was determined that  $\text{Mn(II)(Pybox)Cl}_2$  demonstrated the highest stability in acetonitrile. Dimethylacetamide presents as an

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attractive candidate for further examination due to its wide potential window and low coordination ability relative to the aforementioned solvents.

**506 1:00 pm 39****How Specific Conductivity Analysis Can Aid in Identifying Peak Wastewater Outflow of the Tijuana Estuary****Cara Higashi, Bachelor of Arts in Geography (U)**

In the last few decades, rapid urbanization and population growth around the Tijuana Estuary has disrupted the river ecosystem due to the influx of wastewater entering the system. With this quickly changing environment, water quality technology has shifted to exploring the benefits of instantaneous solutions to detect concentrated waste water runoff. As wastewater from the Tijuana River is dispelled into the estuary, hypothetically this freshwater inflow is mixed with the salt water of the ocean lowering its overall concentration. This mixing may not occur resulting in freshwater lensing; this would mean higher concentrations of sewage may flow directly into the ocean. By utilizing specific conductivity sensors near the river mouth that monitor water quality in real time, we can aid in the early detection of sewage water outflows. In order to decipher when these high concentration events occur, we use specific conductivity sensors at different depths to help identify a salinity gradient and determine which tidal functions cause these events. By analyzing data collected from the Tijuana Estuary Boco Rio site at the surface and near-bottom of the channel, we may be able to find a correlation between surges of freshwater flow during storm events and variances in salinity.

**507 1:00 pm 40****Utilizing Dihedral Angle Control as a Strategy to Obtain Selective Diarylamine Kinase Inhibitors****Alyssa Gomez, Bachelor in Chemistry, emphasis in biochemistry. (U)**

One of the key aspects that drives the research in our lab is atropisomerism, a type of conformational chirality that occurs when there is hindered rotation about a chiral bond. This hindered rotation results in a spontaneous mechanism of racemization, with atropisomers spanning a spectrum of stereochemical stability dependent on their half-lives of racemization. Our group has shown that Class-1 atropisomers bind to targets in a small subset of conformations, and that different targets can prefer different subsets of conformations about the same atropisomeric axis. Building on this hypothesis, we have shown that tuning the dihedral angle of the atropisomeric axis towards the target's preferred low-energy dihedral angle conformation can cause significant gains in the selectivity of kinase inhibitors. Diarylamines, which possess two contiguous axes, are one of the most privileged scaffolds in drug discovery. An analysis of the protein data bank revealed that out of 1600+ entries, approximately 100 ligands bind their target in conformations where one of the axes is planar and the other axis is near-orthogonal. Our research aims to increase the selectivity of diarylamine kinase inhibitors by preorganizing

their atropisomeric C-N axes into these unique dihedral angle binding conformations. We hypothesize that the selectivity of Neratinib, a promiscuous irreversible kinase inhibitor currently used to treat HER2-positive breast cancer, can be significantly improved by preorganizing or 'tuning' its atropisomeric axes towards the preferred low energy binding conformations of HER2, thus reducing off-target kinase inhibition and adverse side effects seen in the clinic. We are currently synthesizing dihedral angle tuned and atropisomerically stable Neratinib analogs by adding steric bulk adjacent to the more electron rich chiral axis and employing intramolecular hydrogen-bonding across the quinoline C-N axis. With these compounds in hand, we will evaluate their selectivities and potencies against HER2 and a panel of off-target kinases, as well as conduct in vitro studies in HER2 driven cancer cell lines.

**Session H-7**

Health, Nutrition, and Clinical Sciences

**Friday, March 1, 2024 1:00 pm**

Montezuma Hall

**508 1:00 pm 41****Effect of Service Learning On Students' Perceptions of Low Income Populations****Lauren Johnston, Bachelor of Science in Nursing (U)**

Service learning experiences (SLEs) are teaching/learning strategies that are designed to allow students to apply their knowledge and skills to real world situations while having a positive impact in the community. Through SLEs, students are able to gain experience, develop critical thinking skills, and better understanding of the healthcare system and its population. SLEs can expose students to diverse communities and populations where social determinants of health and health equity issues often exist, supporting patient centered care through the development of cultural competency. This project examined the impact of a SLE on nursing students' perceptions of low income populations through reflective journaling. Reflection surveys were administered to the student's pre- and post-experience to elicit their perceptions of low income populations prior and after completing the SLE. The SLE consisted of data collection from low income populations who reside in unincorporated communities in Imperial County, California. Students reported better understanding of the health needs of low income populations, were unaware of their own bias and preconceived ideas and realized that an individual's journey to low income status is multifaceted. Students were surprised that a person's literacy abilities were not necessarily dependent on their education level and were more trusting of health information provided by family and friends rather than their healthcare providers. The SLE supported development of student empathy, cultural competence and empowerment, qualities that support trust between patients and their healthcare providers. SLE's can provide structured opportunities for nursing students to learn about individuals from diverse backgrounds while serving their community.

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Through these experiences, nursing students are empowered to identify barriers and challenges to health equity and inspired to advocate on behalf of communities in need.

### 509 1:00 pm 42

#### Single-leg Resistance Exercise Training in Mice Leads to a Decrease Followed by an Increase in In Vivo Torque of Anterior Crural Muscles

**Lloyd Kane Thomas Marshall, Bachelor of Science in Kinesiology (U)**

Resistance exercise is known to produce muscle hypertrophy. However, little is known about the role of muscle satellite cells in generating new myofibers or in incorporating satellite cells to live myofibers during exercise training. **PURPOSE:** To investigate whether single-leg resistance exercise training can activate the incorporation of muscle satellite cells in mice. **METHODS:** Transgenic male mice (12 weeks old) that express Td-Tomato fluorescent protein in Pax7+ (i.e., satellite cells) cells (Pax7CreER-Ai9) were treated with tamoxifen (2 mg in corn oil, i.p.) once a day for 5 days. Three days later, mice were single-leg exercise trained (i.e stimulation of the peroneal nerve of the right leg of each mouse to evoke fused tetanic contractions [100 Hz] of the anterior crural muscles), 3x per week for either 1 or 2 weeks. Each training session was composed of 3-s contractions with 7 s recovery between contractions, 10 contractions each set, 5 sets with 5 min rest between sets. Before the first training session and 3 days after the last training session (1 week or 2 weeks training), torque produced by the ankle was measured at different frequencies of pulse-stimulation (1-200 Hz), mice were euthanized, and muscles were frozen for histological measurements. **RESULTS:** During each session of training, peak torque developed at the last contraction was ~30% of the torque developed in the initial contraction of the session suggesting fatigue development. Between sessions of training, initial torque was not significantly different suggesting that muscle recovered function between sessions. Torque measurements at different frequencies of stimulation 3 days after 1 week or 2 weeks of training showed a ~50% decrease in maximal tetanic torque relative to the mice body weight, after 1 week of training but there was a recover in torque at 2 weeks of training. **CONCLUSION:** Resistance exercise training in mice by using single-leg electrical stimulations leads to a fast (i.e., 1 week) decrease in muscle force development.

### 510 1:00 pm 43

#### Nitrate Supplementation Decreases In Vivo Muscle Torque Without Affecting Recovery From Injury in Mice

**Dylan Kasper, Bachelor of Science in Kinesiology (U)**

Investigate whether nitrate supplementation affects in-vivo torque recovery after muscle injury produced by intramuscular injection of BaCl<sub>2</sub>. Transgenic male mice (12 weeks-old, n=8) that express Td-Tomato fluorescent protein in Pax7+ cells (Pax7CreER-Ai9 mice) were randomly separated in two groups

(water and nitrate). One week before muscle torque testing and muscle injury, all mice were treated with tamoxifen (2 mg, intraperitoneally) once a day for 5 consecutive days while also exposed either to 1 g/L of NaNO<sub>3</sub> in drinking water (nitrate group) or non-treated water (control group). In the nitrate group, NaNO<sub>3</sub> was provided until mice were euthanized. One week following treatment initiation, both legs from each mouse were individually subjected peroneal nerve stimulation to evoke contractions of the anterior crural muscles (1-200 Hz; Torque-frequency curve). After TFC, one leg was subjected to intramuscular injections of 1.2% BaCl<sub>2</sub> (intramuscularly) to produce injury of the tibialis anterior and extensor digitorum longus muscles. In the contralateral leg muscles were not injured. TFC were tested again on both legs on days 2, 7, 14 and 21 post BaCl<sub>2</sub> injection, then mice were euthanized, and TA muscles were dissected for histology. TdTomato fluorescence was used as a marker of muscle regeneration. In both legs before injury, maximal torque was statistically lower in mice from nitrate vs water groups (103 ± 3 vs 84 ± 2 Nmm/kg, for water vs nitrate groups in non-injured leg, respectively, P>0.05, and 96 ± 9 vs 73 ± 9 Nmm/kg for water vs nitrate groups in injured leg, respectively, P>0.05). During recovery from injury, torque developed by mice from the nitrate group was still lower than from the water group (P<0.01), when torque was normalized by the torque developed by the non-injured leg, there was no difference between groups on days 2 (28 ± 13% vs 25 ± 1%), 7 (41 ± 4% vs 35 ± 2%), 14 (81 ± 7% vs 87 ± 1%) and 21 (104 ± 3% vs 105 ± 3%) for water and nitrate groups respectively. Data suggests that nitrate supplementation decreases nerve-stimulated torque development and does not change the recovery of torque after BaCl<sub>2</sub> injury.

### 512 1:00 pm 45

#### Semantic Abilities in Children and the Effects of SES

**Noelle Villegas, Bachelor of Liberal Arts in Speech Language and Hearing Sciences (U)**

A child's semantic abilities are influenced by a plethora of variables, including socioeconomic status (SES). This is especially relevant in San Diego County, an area of diverse demographics. SES can be measured in a number of ways, including parental education and income. Parental education and income have each been examined separately in relation to children's semantic knowledge. However, a parent's education level has a major impact on their contribution to the total family income; someone with a bachelor's degree has 84% higher median earnings compared to someone exclusively with a high school diploma. Past SES studies mainly include one measure of SES, but here we include two measures, leaving room to look deeper into the intricate relationship between SES and a child's semantic ability.

In this study, parents completed a demographic questionnaire that included questions about their highest completed level of education and annual household income. Children, ages 8 to 14, completed a series of assessments of their language skills, including a measure of semantic ability and lexical knowledge (i.e., the Vocabulary Assessment subtest of the Test of Integrated Language and Literacy Skills).

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We predict that a child's semantic ability will be dependent on their family's SES when measured based on both education and income. Looking at the SES measures independently, we predict a positive relationship between each factor and a child's semantic abilities. Therefore, we expect children with parents with a higher completed level of education to have more proficient semantic abilities. We also expect to see this relationship in the other SES factor we are measuring, annual household income, such that children whose parents have a higher annual income will have a higher level of semantic ability. These findings would suggest that social and economic factors are reflected in a child's ability to understand, interpret, and link together various words. This study will contribute more information on how to accurately measure a child's SES and whether children from specific SES backgrounds should be offered additional resources to improve particular branches of language ability, specifically semantics.

### 513 1:00 pm 46

#### The Effects of Concert Noise Exposure on Hearing in Young Adults

**Natalie Ybarrondo, Bachelor of Arts in Speech, Language, and Hearing Sciences (U)**

This research project investigated the effects of concert noise exposure on hearing in young adults, primarily on changes in distortion product otoacoustic emissions (DPOAEs). The aim was to identify any potential changes in auditory function after exposure to loud concert noise in 40 participants.

Recruitment focused on participants between the ages of 18 and 35 years old. Survey data were first collected from each participant to help understand what factors may have contributed to any changes in auditory function. Then, a comprehensive audiometric testing protocol including otoscopy, tympanometry, acoustic reflex thresholds, DPOAEs, and pure tone hearing tests was administered. Outcome data for this study included DPOAEs, a low-frequency (0.25, 0.5, 1, 2 kHz) pure-tone average (PTA), and a high-frequency (3, 4, 6, 8 kHz) PTA for each ear.

To begin, 32 participants were tested within 24 hours of noise exposure. Those who reported attending a concert for 3 or more hours and being near speakers had poorer (i.e., higher) high-frequency PTAs in both ears compared to those who reported being at a concert for less than 3 hours and away from speakers, respectively. Also, those who reported longer concert time and closeness to speakers had poorer (i.e., lower) DPOAEs at 4 and 6 kHz compared to those who reported less concert time and being away from the speakers. None of these differences were statistically significant. For the 13 participants with pre- and post-concert data, there was a decrease in DPOAEs at 5 of 6 frequencies in the left ear after the concert; while for the right, there was a decrease at one frequency.

Data from the current study show that the auditory system is vulnerable when exposed to loud music for longer durations. One limitation of the current study was the amount of time between exposure and testing. To reflect the most accurate noise-induced changes, the time between noise exposure and testing should be minimized in order to capture the greatest

change in auditory function. Although the changes were temporary, further research is required to fully understand the long-term impact of this type of noise exposure.

## Session H-8

Behavioral and Social Sciences

Friday, March 1, 2024 1:00 pm

Montezuma Hall

### 514 1:00 pm 47

#### Growing Together: The Production of Community in San Diego's Urban Gardens

**Joya Euceda Victoria, Doctorate in Philosophy in Geography (D)**

Urban agriculture has become increasingly popular in many cities across the United States in the past decade. Advocates argue that cultivating food in urban environments provides various benefits, such as access to healthy food, increased green spaces, opportunities for physical activity, and social connections. Low-income individuals, people of color, and immigrants are typically portrayed as the primary beneficiaries of collective gardening, which presumably helps them "grow roots," create a sense of place, find social cohesion, and address food insecurity. Yet, due to historically racialized urban policies, investment patterns, and land use planning, these groups also face limited access to environmental amenities such as safe green space, healthy land, and clean air, limiting their ability to garden in the city.

This presentation relies on extensive data, including interviews and audits, collected from 53 gardens in the urbanized part of San Diego County during the fall of 2023. Preliminary findings suggest that most growers use gardens as a space for community building rather than as a necessity to grow food. We aim to better understand the spatial nature of community building by comparing the roles of garden managers and the physical characteristics of community gardens in fostering a sense of place and belonging. Garden managers typically facilitate events, enforce garden rules, and manage waitlists, with varying levels of input from other members. These activities influence the sense of belonging and community. These are also reflected in and shaped by key physical characteristics, such as fences, seated/shaded areas, and locks. These may also influence inclusion and belonging, including openness to neighborhood residents and "outsiders." Building on existing literature of community, this presentation draws from six community gardens within San Diego County representing high- and low-income areas to investigate community building and social inclusion processes. We hypothesize that class and race influence the organizational and spatial structures of gardens and their impact on the parallel processes of place-making and community-building. Results from our analysis will provide valuable information for initiatives to increase equitable opportunities in urban agriculture within San Diego by questioning the meaning of community in community gardens.

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**515 1:00 pm 48****The Relationship between Burdensomeness and Social Motivation****Alicia Yee Lok Assang, Masters of Arts in Psychology (M)**

Social connection is integral to functioning. A lack of social connection leads to both physical and mental health complications. Burdensomeness – one believing they are liabilities to others – may threaten the maintenance of social connection, especially with existing close social connections, yet little is known about the relationship between burdensomeness and the desire to connect with others, also known as social motivation. The current study, therefore, explores whether burdensomeness is associated with social motivation with the hypothesis that higher burdensomeness would be associated with lower social motivation for existing, but not new, social connections. To test the hypothesis, 385 participants ( $M = 22.56$  and 50.6% women) completed an online survey that asked about their perceived burdensomeness (measured through the interpersonal needs questionnaire), their present social motivation to maintain existing connections and develop new connections (measured through the state motivation to foster social connections scale), and current depressive symptoms. As hypothesized, there was a correlation between burdensomeness and social motivation for existing relationships after adjusting for depressive symptoms; greater burdensomeness was associated with lower motivation to interact with existing connections,  $r = -.124$ ,  $p = .015$ . However, there was no relationship between burdensomeness and social motivation for new relationships,  $r = -.037$ ,  $p = .468$ . Results reveal a previously unrecognized barrier to social connection, namely feelings of burdensomeness. Our findings not only suggest that burdensomeness is associated with low social motivation above and beyond depressive symptoms, but also that burdensomeness might be particularly harmful for existing social connections. As such, future experimental research could examine the effect of burdensomeness on the desire to connect with existing connections and the implications for continued connection.

**516 1:00 pm 49****Innovation Orchards: Can innovation-encouraged labs nurture the seedlings of students' motivation and interest in STEM?****Chih-An Bian, Masters of Arts in Psychology (M)**

STEM fields nurture boundless possibilities for groundbreaking research, tackling complicated problems and improving human society. Aspiring students often envision themselves as scientists with the opportunity to contribute positively to the world. Faculty-led research laboratories serve as the initial gateway for undergraduate students to familiarize how innovation sparks, and start thinking and working like a creative scientist (Hunter et al., 2007). But all labs are not the same. Labs consist of different norms, beliefs and other social contexts of science, forming different microcultures (Thoman et al., 2017). We expect the microculture of “innovation encouragement (Canning et al., 2020)” varies across labs, with

consequences for student experiences in those labs. Some labs welcome and support innovation, while others prioritize playing it safe and minimizing risks. We expect that these varied experiences influence students' perception of STEM fields, shaping their interest and motivation to continue to pursue STEM. A total of 627 student researchers working in 117 faculty labs across three universities participated in a survey study of research experiences and motivations. To investigate the relationships between innovation encouragement and student experiences, we employed multi-level correlation analysis. We found that students who reported greater innovation encouragement in their labs perceive a more comfortable lab atmosphere ( $\beta = .35$ ,  $p < .001$ ) and felt more comfortable raising disagreement in the lab ( $\beta = .32$ ,  $p < .001$ ). Additionally, they perceive themselves to be more competent ( $\beta = .27$ ,  $p < .001$ ), consider their lab work more interesting ( $\beta = .43$ ,  $p < .001$ ), and have higher intention to pursue STEM careers ( $\beta = .19$ ,  $p = .004$ ). Our findings suggest the microculture of innovation encouragement plays a crucial role in student's lab experiences and their motivation and interest toward STEM.

**517 1:00 pm 50****Neighborhood adversity, social support, and depression and anxiety symptoms in a low-income migrant community on the U.S.-Mexico border****Rebeca Jimenez, M.A. Psychology (M)**

Background: Low-income individuals with migration history are at risk for poor mental health due to social and systemic adversity (e.g., food/housing insecurity, migration stress, family separation). Prior research has demonstrated links between neighborhood quality (e.g., walkability, safety) and depression and anxiety symptoms, but few studies have involved migrant populations along international borders. Social support is associated with mental health and may influence the relationship between neighborhood adversity and depression and anxiety symptoms.

Purpose: To examine associations of neighborhood adversity with depression and anxiety symptoms in a low-income U.S.-Mexico border population and explore whether perceived social support moderates these relationships.

Methods: This cross-sectional study recruited adults seeking health care at a free clinic in Tijuana, Mexico in 2016. Neighborhood adversity was measured using a 30-item neighborhood characteristics scale with five subscales (social cohesion, walking/exercise environment, healthy food access, crime/safety, aesthetic quality). Depression symptoms were assessed using the 8-item Patient Health Questionnaire (PHQ-8). Anxiety symptoms were assessed using the 7-item Generalized Anxiety Disorders scale (GAD-7). Social support was measured using the 12-item Interpersonal Support Evaluation List (ISEL-12).

Results: Participants were 206 adults ( $M$  age=47.2,  $SD=11.9$ ); 77% were male; 76% reported history of migration to the U.S. and/or deportation (forced removal). Prevalence of clinically significant depression and anxiety symptoms were 37% and 33%. Mean ISEL-12 score was 19.6 ( $SD = 5.9$ , range = 0-36). Adjusting for age, sex, and education, individuals with higher

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neighborhood adversity had higher depression ( $r = 0.05$ ,  $p = .01$ ) and anxiety ( $r = 0.05$ ,  $p = .03$ ) symptoms. In subscale analyses, poorer neighborhood aesthetic quality was associated with depression and anxiety symptoms and higher crime/unsafety was associated with anxiety symptoms. Social support did not moderate the relationships between neighborhood adversity total score or subscale scores and depression and anxiety symptoms.

Conclusion: Neighborhood adversity is a potentially modifiable correlate of poor mental health in low-income individuals along the U.S.-Mexico border. Interventions to improve neighborhood factors (e.g., aesthetic quality, safety) may reduce risk for depression and anxiety.

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**518 1:00 pm 51**

### Unstuck and On Target Therapists : A Cultural Lense on Delivering Mental Health Interventions

**Jocelyn Dominguez, M.S in Child Development with a Concentration in Early Childhood Mental Health (M)**

Currently, disparities in services for the Latinx autistic youth exist, including those per (Magana et al., Mandel et al., 2009) are present in our system. These disparities include and influence the quality of services that many families are receiving. Cultural adaptations to mental health interventions are required in order to obtain positive outcomes and potentially address disparities in services. These adaptations often include changes to the intervention. According to Bernal, Jimenez-Chafety, and Domenech Rodriguez (2009, pg. 362) a therapist should take into consideration the client's language, culture and values in order to meet the client's needs (Bernal et al., 2009). Research demonstrated that there is a high need for cultural adaptations when delivering mental health interventions for the diverse families who have a family member who is diagnosed with autism (Chlebowski et al., 2019). An ongoing study focused on testing an intervention specifically adapted for use with autistic youth in mental health settings. Notably, this intervention was originally developed and shown effective when delivered in diverse school settings, with association between how this intervention was delivered and youth characteristics. This study will focus on investigating if there is an association between the therapist's use of Unstuck and On target, an executive function intervention adapted for use in mental health settings, and the client's race/ ethnicity. Analyses of mean differences are anticipated to address this question. Results will inform further efforts to adapt this intervention for the mental health service settings serving diverse youth and families.

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**519 1:00 pm 52**

### Elders' perspectives on the environment: A collaborative exploration for brownfield revitalization in National City, CA

**Jacquleen Weeden, Master of Arts in Geography (M)**

Community members hold invaluable, firsthand knowledge of their communities' history, traditions, and cultural nuances, offering unique perspectives often unseen or not sought out but

powerful for informing decision-making. Through a collaborative effort between college students, the City of National City Senior Center and Nutrition Center, and elders from National City, CA, I collected 42 oral history interviews containing environmental discourse between elders from a diverse city in Southern California and San Diego State University students. These conversations focus on understanding and promoting the interconnection between human behavior and environmental conservation to contribute to the growing literature on conservation psychology. The study also completed surveys with the elders to understand their interaction with the environment throughout their lifetime, to see if they are aware of brownfield presence in their community, to hear how they would like brownfield sites to be revitalized in their community, and more. This study used oral history interviews and surveys to create safe spaces for elders to share their memories and perspectives and contribute to historical and geographical narratives that allow elders to craft their retelling of events. An analysis of transcribed oral history interviews will analyze word choices and non-verbal elements such as pauses or silence, expressing uncertainty or confidence, or emphasis on words or statements that will help conceptualize an understanding of the state of the environment amongst elders in National City. Additionally, a stratified analysis of the surveys will allow for comparisons between different subgroups, revealing variations in responses across demographics or other relevant characteristics. This research aims to amplify elders' voices and inform decision-makers and planners to revitalize brownfield sites to create an urban green environment where elders can healthily and safely age in place. Through these methods and analyzing the results, I argue that elders value and recognize the importance of accessible green spaces and, to an extent, are aware of the climate emergency and feel a sense of urgency, not for themselves but for future generations.

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**520 1:00 pm 53**

### Community Views: A Study on Community Perspectives on Public Restrooms in San Diego County

**Malaya Cilley, Master of Public Health (Health Promotion and Behavioral Science) (M)**

#### BACKGROUND

Approximately 1 million individuals across the United States lack access to basic water, sanitation, and hygiene (WaSH) services, leading to a variety of adverse health outcomes. One region where WaSH access is a major public health problem is San Diego, California, where only 669 public restrooms are available to serve thousands of individuals across the County. Despite the clear inadequacy of the current facilities, it is hypothesized that a major barrier to providing equitable access to public restrooms is the lack of public support. This study aims to identify the motivating factors underlying the opposition to, and support of, increasing equitable access to public restrooms in San Diego County.

#### METHODS

This study uses the mixed-method approach Concept Mapping,

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which identifies, explores, and ranks community concerns regarding public restroom access in two phases: phase I–Brainstorming and phase II–Sorting and Rating. Participant recruitment and data collection occurred using in-person (n=95 at five key locations) and online modalities (n~136) with the sample size varying for each phase. Between July 2022 through November 2023, Phase I generated 175 statements, condensed down to 39 statements, in response to the focal question: “What’s one reason, for or against, having more and better public restrooms in San Diego?” These statements inform the activities of Phase II, which is currently underway.

#### RESULTS

Our research team is actively collecting data for Phase II, but preliminary results from Phase I suggest that there is less opposition to increasing access to and availability of public restroom facilities than expected. Participants' responses centered on issues including human rights, dignity, and economic and health benefits (e.g., “Public restrooms reduce the transmission of diseases” and “Public restrooms ensure human dignity”).

#### CONCLUSION

Results will advance understanding of how to garner support to increase public restroom access. In return, this will aid in the advancement of health equity for various populations throughout San Diego County.

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### 521 1:00 pm 54

#### The Effects of Choline and Exercise Treatment on Anxiety-Like Behavior Following Prenatal Alcohol Exposure

**Liana Manriquez, Masters of Arts in Psychology (M)**

The nutritional supplement choline or exercise can mitigate cognitive abnormalities associated with prenatal alcohol exposure. Interestingly, prenatal alcohol exposure can increase anxiety, but it is not known whether these interventions reduce anxiety. Thus, we are using a rodent model to examine whether choline, exercise, or the combination reduces anxiety related to prenatal alcohol exposure. Sprague-Dawley rats either receive ethanol exposure or are controls. Then subjects receive either choline, exercise, or the combination. Next subjects complete behavioral testing to examine anxiety. This study uses a 2 (ethanol, sham) x 2 (choline, saline) x 2 (exercise, no exercise) x 2 (female, male) design. From postnatal days (PD) 4-9, the developmental period equivalent to the 3rd trimester in human pregnancy, ethanol-exposed subjects receive milk diet containing ethanol (11.9% v/v, 5.25 g/kg) by oral gavage; controls receive a sham procedure. During adolescence, from PD 10-30, subjects receive daily injections of either choline chloride (100 mg/kg/day) or saline. From PD 22-33, half the subjects have access to a running wheel and the other half do not. In adulthood, on PD 67, subjects are tested on the elevated plus maze to measure anxiety. Subjects are placed on a plus-shaped elevated platform with two open and two enclosed arms for 5 minutes. Since rats have a natural tendency to avoid open areas due to potential exposure to predators, rats who spend more time in open arms exhibit less anxiety-related

behaviors. Frequency of entries and time spent in open arms, closed arms, and center area are recorded. All behaviors are coded using OD Log software.

## Session H-9

Biological and Agricultural Sciences

Friday, March 1, 2024 1:00 pm

Montezuma Hall

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### 522 1:00 pm 55

#### MutL loss in ER+ breast cancer alters secretome resulting in pro-tumorigenic macrophage polarization

**Megha Raghunathan, Ph.D. in Biomedical Sciences (D)**

The Mismatch Repair (MMR) pathway, a crucial tumor suppressor mechanism, is dysregulated across cancer types. We previously identified the loss of the MutL complex of the MMR pathway, as a key factor inducing resistance to endocrine therapy in Estrogen Receptor positive (ER+) breast cancer patients. Preliminary data previously generated in the lab supports a role for MutL loss in promoting metastasis of ER+ breast cancer. A mammary-specific knockout mouse model for MLH1, a principal component of MutL, created in the Haricharan lab develops aggressive mammary tumors that metastasize to multiple organs. To unveil the mechanism by which MLH1 loss triggers metastasis, an unbiased RPPA and RNA-Seq was conducted which revealed cytokine secretion in the immune system as a distinctive signature of MLH1- ER+ breast cancer cells. Secreted cytokine levels altered by MLH1 loss were identified in multiple ER+ breast cancer cells lines from concentrated conditioned media. Additionally, in vivo experiments with xenograft MLH1- ER+ tumors in nude mice, revealed an elevated number of CD206 expressing tumor-promoting M2 macrophages in the tumor microenvironment. These findings indicate that loss of MLH1 alters the ER+ breast cancer secretome and alters macrophage maturation, suggesting a role for MLH1 in immunomodulation supporting metastatic progression.

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### 523 1:00 pm 56

#### Raf Kinase membrane activation is modulated by multivalent protein-lipid interactions

**Andres Jimenez Salinas, Doctor of Philosophy Chemistry/Biochemistry (D)**

Cell signaling is responsible for many different cellular events that allows organisms to grow, survive and properly respond to changes in its environment. Signaling pathways such as the MAPK pathway, have been greatly studied due to its medical relevancy, deviation of its normal state may lead to cancers and other neurodegenerative diseases. A key protein in this pathway, Raf Kinase and its activator protein Ras-GTPase have been implicated in almost half of all cancers. To better understand the molecular dynamics and possible points of

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

dysregulation, I am investigating the N-terminal regulatory domains of Raf, the Ras binding domain (RBD) and cysteine rich domain (CRD). Various molecular events are required for Raf to become fully active and transduce the signal such as Ras binding, membrane recruitment, and dimerization. The transition from inactive to active state and molecular mechanism lead to Raf's fully activated state are not well understood. To recapitulate the membrane environment, I have prepared supported lipid bilayers (SLB), this method allows me to precisely control the lipid composition of SLBs. Purified protein Raf constructs were specifically labeled with a small inorganic dye using a Sortase ligation reaction. Using fluorescent microscopy, I have characterized the biophysical properties of Raf's individual and tandem regulatory domains. I employed total internal reflectance fluorescent microscopy to measure membrane recruitment through protein and/or lipid interactions under different lipid compositions. These measurements will provide valuable information on how the activity of Raf is modulated by these protein domains and how its lipid environment may impact its stability on the membrane. The data obtained from the experiments will provide a better overall picture of the activity of Raf and may contribute to the advancement of cancer therapeutics.

**524 1:00 pm 57**

### Chemical leachates from microfibers perturb embryonic development in zebrafish

**Angus Fletcher, MS: Environmental Health (M)**

Microplastic fibers (MPFs) are the most common type of microplastic found in the marine environment. Textile production is the largest source of MPF pollution and chemical additives are often applied to both natural and synthetic fibers to enhance desirable properties. Endocrine disrupting chemicals are among the most common chemical additives in textiles and can elicit a range of toxicological responses, including oxidative stress and developmental toxicity. Currently, no experimental studies have investigated the toxicity of microfiber chemical leachates. The effects of 4 different textile microfiber leachates on zebrafish survival, hatching, toxic endpoints, and gene expression, under photolytic (light) or non-photolytic (dark) were evaluated. Zebrafish embryos were exposed to MPF leachates produced from 3-day solar simulated (light) or non-solar simulated (dark) conditions. Leachates were prepared as 20 g/L solutions, then diluted for experiments to 0%, 25%, 75%, 100%. Leachates from untreated, non-dyed polyester, polyester/cotton blend, nylon, and cotton were used. Embryos were exposed from 0-4 days post fertilization (dpf). Survival and hatching were screened daily, and embryonic morphology and transcriptomics were assessed at 4 dpf. Increased exposure to nylon and cotton leachates increased the incidence of developmental deformities, mortality, and prevented or delayed hatching. Increased exposure to polyester leachates also increased the incidence of developmental deformities, mortality, but did not have an effect on hatching. Increased exposure to polyester/cotton leachates had no effect on mortality and hatching rates, and had a minimal effect on the incidence of developmental deformities. Overall, this work demonstrates that MPF leachates have different levels of embryotoxic effects depending on the

polymer and the composition of its chemical additives.

This research was supported by the California State University Council on Ocean Affairs, Science & Technology.

**525 1:00 pm 58**

### Non-targeted Analysis for Chemical Contaminants in Sediment near cannabis farms within Carpinteria county

**Alex Lee, Masters Public Health - Environmental Health (M)**

With California's legalization of recreational use and commercial farming of cannabis in 2016, there has been a significant surge in both the consumption and production of cannabis, particularly in Santa Barbara's Carpinteria county, one of the largest regions growing cannabis in the state. However, since cannabis farming has only been legalized at the state level for less than a decade, it is not well documented how closely local farms are adhering to California's regulations, potentially exposing citizens to unregulated pesticides. This study addresses pesticides and chemicals of concern detected within soil samples taken from 20 locations near cannabis farms located in Carpinteria county, and examines their potential health impacts on both human health and local ecosystems. Samples collected in watersheds near the farms were extracted by using solid-phase extraction and then analyzed with two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (GCxGC/TOF-MS). In total, 801 total unique compounds were identified, with 90 unique compounds found across all sampling sites. As it currently stands, there is minimal research investigating organic chemical contaminants in watersheds associated with cannabis farms. This study illuminates the presence of contaminants from the sampled cannabis farms that are potentially leaching into the local environments. There is a dire need to address the knowledge gap of what kinds of chemical contaminants are being used from cannabis farms to then understand how these contaminants are impacting both human health and the environment, which can potentially serve to help promote policy and regulations for future cannabis related legislation.

**526 1:00 pm 59**

### Characterizing the Bacteroidales injection system from a human gut bacterium

**Josefa Rivera Alfaro, Masters of Science in Cell and Molecular Biology (M)**

Bacteroides are present in a large percentage of healthy adult microbiomes. However, the mechanisms that Bacteroides use to interact with their human hosts remain poorly understood. The genome of Bacteroides spp. encode a contractile injection system (CIS) that we suspect is involved in bacteria-host interactions. Although this gene system, named Bacteroidales injection system (BIS), is homologous to CIS found in other bacterial species that interact with eukaryotic partners, the structure and function of BIS has yet to be determined. CIS are classified into two types; type 6 secretion systems are cytoplasmic/inner membrane bound and extracellular

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CIS which are released into the environment. However, the BIS structure has yet to be detected and observed using molecular methods in the laboratory. My preliminary data using western blots of *B. cellulosityticus* cell pellet and supernatant shows that the localization of the BIS tube/sheath structure to be membrane-bound rather than excreted. We identified regulators of BIS genes, including potential transcription factors that down-regulate the expression of the BIS gene cluster.

-galactosidase activity assays confirmed the suppression of the BIS promoter-driven transcription by the negative regulators. *B. cellulosityticus* mutant strains lacking these negative regulator genes were created. I hypothesize that strains with deleted BIS negative regulators will overexpress the BIS structures, paving the way to visually confirm BIS for the first time. By confirming the existence of BIS structures, this will advance research that could contribute to gastrointestinal disease treatment as well as investigate biomedical uses for contractile injection systems as therapeutic delivery systems.

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### 527 1:00 pm 60

#### Identifying the mode of microbial origin of black spot disease in sea urchin *Lytechinus pictus*

**Jenna Luc, Cell and molecular biology, Microbiology (M)**

“Black spot” or “bald” sea urchin disease (BSD) is a pathogenic infection that adversely affects adult sea urchins, a keystone species in every marine ecosystem. The incidence of BSD is increasing with global warming as microbial marine populations shift with climate change. The source of BSD has yet to be characterized in the painted urchin (*Lytechinus pictus*), although epidemics are emerging in local and lab-reared populations of Southern California. Infected urchins display a progression of symptoms, starting with loss of spines and degradation of skin tissues. In severe progression of the disease, these lesions can permeate into the skeleton and cause death. A strain of *Vibrio* bacteria is strongly associated with BSD lesions in the adult test of green sea urchins. However, literature is sparse on the original source of the infection, and BSD has not been documented in *L.pictus*, a recently genetically-enabled model organism.

To identify potential microbial origins of BSD that can be cultured and studied in the lab, samples of water and lesions of increasing stages of necrosis were plated on marine agar. Dozens of single colonies of bacteria were sequenced for 16S ribosomal DNA, where a total of 8 unique genera were identified. We found that *Vibrio* spp. and *Pseudoalteromonas* spp. are unique to growing lesions in *L.pictus*. These may represent opportunistic pathogens. To test this hypothesis, healthy urchins are exposed to these isolates and tracked for lesion development. By isolating and validating the microbes associated with BSD, a systems-level understanding of how different bacteria are able to establish their pathogenic niche in *L.pictus* will be built. This will help mitigate BSD infection in lab-reared urchins and provide insight for the management of the disease in natural populations.

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### 528 1:00 pm 61

#### Improving Training Data for Machine Learning-Based Protein Function Prediction Tools **Sean Fahey, MS Bioinformatics and Medical Informatics (M)**

Current sequence homology-based annotation methods face challenges in accurately annotating bacteriophage genes due to significant amino acid sequence variation between proteins within the same functional class. Surveys of the GenBank databases have shown that between 50-90% of genes encoded by bacteriophages are too distant from proteins with known functions, and thus are labeled as hypothetical proteins or unknown proteins. Of particular concern are structural proteins, which encompass a substantial fraction of each phage genome and are present to different degrees in all phages, and are highly variable and particularly difficult to annotate. We have developed two new annotation methods based on Neural Network Classifiers - an Ensemble Neural Network and a Transformer-based model. Both show significantly greater sensitivity over sequence homology-based methods. These methods work by classifying each protein sequence as one of 10 phage structural protein classes, or as an “Other” class that contains a broad range of non-structural viral proteins. Our models have been trained and validated on a phage protein dataset comprised of 538,213 protein sequences from the NCBI protein database that were curated by our lab. However, mistakes in the original annotations in this dataset may limit the potential accuracy of the models. Since this dataset was originally assembled, a substantial number of newly annotated phage proteins have been added into GenBank. Training our models on a new, more carefully curated dataset will improve the accuracy of our prediction tools. To further evaluate these models, we are using AlphaFold2 to calculate predicted crystal structures of specific proteins in the testing dataset. Clustering these proteins with their closest published phage protein crystal structure will enable us to identify structural similarities across groups of proteins that either one or both models struggle to predict accurately. We are using this approach to identify and exclude mis-annotated sequences from the dataset. By leveraging a carefully curated dataset and incorporating recent annotations, our research aims to enhance the understanding and accuracy of Machine Learning Classifiers in annotating bacteriophage genes as well as better understand the structure-function relationships of viral proteins with different structural functions.

### Session H-10

Engineering and Computer Sciences  
**Friday, March 1, 2024 1:00 pm**  
Montezuma Hall

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### 529 1:00 pm 62

Microbial abundance in response to varied waste introduction methods in onsite sanitation systems  
**Lilith Astete Vasquez, PhD Engineering Sciences (D)**

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This study assessed the response of microbial communities in bench-scale anaerobic digesters simulating the use of real-world onsite sanitation systems under modified introduction schemes. Onsite sanitation systems utilized in rural and developing regions for the management of human fecal waste are overdue for sustainable, site-appropriate improvements to better serve their users and promote protection of public and environmental health. Microorganisms within these systems, which are responsible for various roles including the hydrolysis of organic materials and converting or consuming nutrients such as phosphorus and nitrogen that are harmful to the environment, may exist in different abundances dependent upon the conditions within these systems that dictate their survival. To quantify these differences in abundance, microbial consortia were identified at several stages of operation during two years of non-dilute waste introduction under the following scientifically and culturally relevant schemes: 1) with subtle intermittent mixing, 2) traditionally unmixed with settled solid contents, 3) employing urine diversion for sequestering nutrients, and 4) practicing external discarding of toilet paper.

Samples of supernatant were obtained following 4, 6, 10, 22 and 26 months of operation from bench-scale anaerobic digesters receiving non-dilute waste including dog feces, synthetic urine, and commercial grade toilet paper twice weekly in accordance with their respective waste introduction scheme. DNA extraction followed by 16S rRNA sequencing identified organisms present in each of the four systems at the time of these operational snapshots. Preliminary results illustrate the development of methanogenic archaea communities within the urine diversion tank, which are responsible for the production of potentially capturable greenhouse gas, methane. Several classes of bacteria capable of fermentation – an important step in breaking down organic materials during anaerobic digestion, presented the lowest quantities in the urine diversion tank and increased in all other tanks over time, except for alphaproteobacteria. Data analysis referring to the MiDAS Field Guide will facilitate interpretation of incongruencies observed between waste introduction methods over time. Further, justification for these differences may be encountered through comparisons of chemical characteristics which were monitored throughout the study period.

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### **530 1:00 pm 63**

Effects of physical properties and binder chemistry on mechanical behaviour, and biocompatibility of hydroxyapatite bioceramic scaffolds using binder jet 3D printing

**Maryam Ghorbani, Joint Doctoral Program in Mechanical Engineering (D)**

Since porous Hydroxyapatite scaffolds can be easily prepared with complex design and high dimensional accuracy for treating musculoskeletal diseases. By providing evidence for binder selection in 3D print fabricated bone scaffolds, the key factors governing the binderless bonding mechanism in the 3D printing process are investigated. This study contributes insights into how the binder's chemical composition influences the microstructure and macro-properties of the

fabricated bone scaffolds. The investigation explores the effects of physical properties, including pore distribution and chemistry, on the physical, mechanical, and biological attributes of Hydroxyapatite scaffolds cube shaped manufactured through binder-jet 3D printing. This research aims to identify the optimal combination of physical, particle size and shape chemical, binder concentration, debinding parameters to enhance the overall performance of the bioceramic scaffolds. The mechanical behavior of the 3D printed hydroxyapatite bioceramic scaffolds will be investigated, emphasizing factors such as strength, degradation behavior, and precision. Scaffolds exhibit high mechanical properties and degradation behavior will be promising candidates for applications in bone tissue engineering.

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### **531 1:00 pm 64**

Investigation into Alternative Methods of Binder Injection in Binder Jetting

**Zackary Skinner, PhD in Mechanical and Aerospace engineering science (D)**

Traditional methods of binder and solvent jetting most often employ printer cartridges, or a specially manufactured collection of micrometer-sized nozzles. This creates issues with reliability, and the ability to modify the jetted liquid. To answer these concerns and look into additional benefits, a different method of binder delivery was studied. This method creates a fine mist which is deposited onto the powder bed instead of jet injection. In order to test this method, cubes were manufactured out of stainless steel. The cubes held their geometry throughout the jetting and sintering process and densified to a similar degree as parts manufactured using traditional binder jetting. The results of this method show promise as not just an experimental procedure, but also in industrial machines. However, additional testing is still required to expand on these results.

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### **533 1:00 pm 66**

Fundamental Investigation and Electrical/Electrochemical Characterizations of Glassy Carbon-Based Solution-Gated Field Effect Transistors

**Veronica Zanahuria Santana, Master of Science In Bioengineering (M)**

Transistors are one of the most important devices in the world of electronics. They can be used either as switches or signal amplifiers. Transistors have found their way into a wide variety of applications. One of the most recent applications is sensors for bio-signals. The main advantage of using transistors as biosensors is real-time detection and amplification, which is not possible with passive sensors. Field effect transistors (FET) have been the most researched transistors for biosensor applications. FETs offer fast response, high sensitivity, and reasonable signal amplification. These parameters are determined by the dimensions, materials, and fabrication processes of FETs. For transistors to be used as biosensors, they must be lightweight, flexible, and most importantly

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biocompatible.

This research aims to design, fabricate, and characterize an array of solution-gated field effect transistors (SGFET) that satisfies all the biosensor requirements mentioned above. SGFETs will be fabricated using negative lithography which is a simple and cost-effective fabrication technique. An interesting and innovative aspect of the fabrication of this FET array is the use of glassy carbon for the electrode material. Glassy carbon is a material that offers excellent biocompatibility and electrical properties which are important characteristics in biosensors. To assess the efficiency of the SGFET array, it will be electrochemically and electrically characterized. Cyclic voltammetry, electrical impedance spectroscopy and Mott-Schottky analysis will be used for the electrochemical characterization. On the other hand, 4-point probe measurement analysis will be performed to determine the output curve (I<sub>D</sub>-V<sub>DS</sub>) and transfer curves (I<sub>D</sub>-V<sub>GS</sub>) which are the most important curves to understand the electrical behavior of the FET.

**534 1:00 pm 67**

### Preliminary Assessments of Cigarette Filter Properties

**Eric Wilkinson, Master of Science in Mechanical Engineering (M)**

Despite the significant decline in the smoking rate in recent years, cigarette filters are still commonly littered, resulting in pollution of waterways and dire environmental impacts. The primary material constituent in cigarette filters is cellulose acetate fibers, a bio-based polymer heavily processed by manufacturers. The processing conditions and additives pacify the degradability of cigarette filters, resulting in severe environmental implications, especially in waterways. Hence, the standing hypothesis indicates that manufacturing conditions increase the environmental resiliency of cellulose acetate and significantly reduce its sensitivity to the elements. Therefore, the overarching objective of this research is to comprehensively characterize the thermomechanical and chemical properties of cigarette filters. The characterization approaches include thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), Fourier-transform infrared spectroscopy (FTIR), optical microscopy (OM), and scanning electron microscopy (SEM). TGA is used to determine the decomposition temperatures of the filter components to ascertain the conditions necessary for full and partial degradation in nature. DSC enables the study of phase transitions in polymers by quantifying changes in heat flux over a broad range of temperatures to facilitate industrial composting. FTIR reveals the chemical nature of the filters as a function of smoking conditions. Finally, microscopy is used to report the morphology and topology of the fibers making the cigarette filters. Overall, this research features a multifaceted characterization framework for the thermomechanical and chemical properties of cigarette filters, benchmarking a common environmental pollutant.

## Session H-11

Health, Nutrition, and Clinical Sciences  
**Friday, March 1, 2024 1:00 pm**  
 Montezuma Hall

**535 1:00 pm 68**

### HIV-Related Stigma and Distance to Care in Uganda **Elsa Ghebrendrias, Joint Doctoral Program-Global Health (D)**

HIV stigma (internalized, enacted, & anticipated) is a well-documented barrier that impacts the public health outcomes of people living with HIV in terms of seeking testing and counseling, utilizing care services, and adhering to treatment. This in turn negatively impacts global health initiatives to prevent further HIV transmission. Limited studies have investigated distance to care and the impact of HIV stigma as well as the geospatial dimensions of care seeking behaviors among people living with HIV/AIDS particularly in Sub-Saharan Africa. In this study, the objectives include determining if there is an association between HIV stigma and seeking care at facilities farther away from the nearest health facility among 617 study participants in Central Uganda within the four main districts of Butambala, Mpigi, Mityana, and Gomba. Also, to determine the distance, time, & location of HIV care for study participants. Multiple Linear Regression, controlling for variables of interest including gender, age, SES, education, and marital status was used to determine the association between travel time to an HIV care facility using the variable "time to clinic" and the three types of HIV stigma. Spatial analysis using Near Analysis in ArcGIS Pro assessed the mean distance to HIV care facility study participants reported they attended compared to the mean distance of the HIV care facility nearest their home village. Results indicate Enacted stigma was associated with a longer "time to clinic" ( $\beta = 0.02086$ ,  $p = 0.0279$ ) after controlling for covariates while no association was observed with the other types of stigma. Initial Near Analysis indicates study participants traveled a mean distance of 2.6 miles to their reported facility where last care was received compared to the nearest HIV care facility mean distance of 2.4 miles. Similarly, those with high Enacted stigma traveled a mean distance of 3.1 miles to their reported health facility compared to a mean distance of 2.3 miles for those with low Enacted stigma. These findings suggest those who have actually experienced stigma are more likely to seek care at clinics at further distances. The how and why of the observed association requires further investigation, ideally through in-depth qualitative research.

**536 1:00 pm 69**

### Exploring WNT promoted chromosome missegregation in human pluripotent stem cells **Sakshi Pradhan, Master's In bioinformatics (M)**

Chromosomal instability (aneuploidy) results in tumors or may promote tumor progression by increasing the rate of genetic aberrations. Chromosomal instability can arise due to improper mitosis or spindle checkpoint activity. The Wnt family

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of signaling proteins participates in multiple developments during embryogenesis and has also been implicated in adult tissue homeostasis. Wnt has secreted glycoproteins that bind to Frizzled (FZD) seven-transmembrane span receptors, which are members of the G-protein coupled receptor family. The R-spondin (RSPO) family of proteins acts to stabilize FZD protein and thereby argument WNT signaling. Prior work in the lab demonstrated that excessive WNT signaling in human pluripotent stem cells led to defects in chromosome segregation. The goal of my project is to detect and quantify chromosomal aneuploidy changes in human pluripotent stem cells using single-cell sequencing technologies.

**537 1:00 pm 70****Nutrition Composition and Flavor Profile of Chia Seeds****Marta Carrillo, Master in Nutritional Sciences (M)**

This study investigated the physical properties, nutrient composition, and flavor profile of common chia (*Salvia hispánica*) and desert chia (*Salvia columbariae*) seeds. Although the seeds of these two chia species differed in morphology and color, their nutrition composition was comparable. They both contained 38-40% carbohydrates, 33-35% lipids, 16-19% proteins, 6-7% moisture, and 3-5% ash. The common chia flour was characterized by a distinctive mango-like fruity aroma, primarily composed of key volatiles such as 2,6 dimethyl-7-octen-4-one, (-)- $\beta$ -bourbonene, caryophyllene, humulene, and caryophyllene oxide.

**538 1:00 pm 71****A Critical Analysis of Metformin & Physical Activity in Prediabetes****Amu Darya, Masters of Science in Nursing (M)****Abstract**

The escalating prevalence of prediabetes and diabetes presents a significant global health challenge. Prediabetes, characterized by impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT), often progresses to type 2 diabetes (T2D). The Centers for Disease Control and Prevention (CDC) reports that approximately 96 million U.S. adults are affected by prediabetes. In 2017, 451 million adults had diabetes, which globally cost around \$850 billion and is expected to be 693 million by 2045. T2D can lead to severe complications such as cardio metabolic disease, vision loss, kidney disease, and mental health disorders.

Our project aims to evaluate the efficacy of metformin treatment versus physical activity in preventing the development of diabetes among adults with prediabetes during the critical first year post-diagnosis in the primary care setting.

Design: Literature Review and Synthesis

Methods: We searched 87 studies with keywords of “metformin prediabetes”, and 190 studies using the words “exercise AND prediabetes” through the search engine Pubmed. 20 studies with metformin therapy and 20 physical activity studies were analyzed including international studies. The U.S. Diabetes

Prevention Program offers robust data due to its large sample size and extended follow-up period, although its diverse participant base introduces potential confounding variables.

**Result:**

After reviewing pharmacological management and lifestyle changes, three studies demonstrated that the group engaging in physical activity was effective in reducing HbA1c by 0.33% compared to the control group with no exercise or other physical modalities. Three studies revealed that metformin therapy reduced the risk of diabetes by 31%. When combined, metformin with lifestyle interventions was 17% more effective than lifestyle interventions alone. Studies on the efficacy of different exercises in improving glycemic control have yielded mixed results.

**Conclusions:**

Early detection of pre-diabetes conditions is crucial, and a comprehensive approach combining metformin treatment with personalized lifestyle interventions has proven to be more powerful than a single intervention. Regular monitoring and adjustments based on individual responses are essential. Ensuring generalizability requires inclusive research involving diverse populations.

**539 1:00 pm 72****Training Elders Against Hypertension (TEAH) Initiative****Kenya Benitez, Master's of Public Health (M)**

During my time in the PH 605 Health Services Administration course, I identified a public health problem prevalent in San Diego County and made a theoretical program addressing the issue as a semester-long project. I created the Training Elders Against Hypertension (TEAH) Initiative. This theoretical program helps older adults better manage their chronic illnesses and lower their blood pressure by providing the necessary education and tools to exercise at home. The reason why I chose this program is because long-term high blood pressure can lead to severe heart disease, the number one killer in the United States. In the North Inland region of San Diego County alone, there were over 2,500 hypertensive disease-related hospitalizations among people over the age of 65 in 2021. This program is aimed towards older adults as the Centers for Disease Control and Prevention (CDC) have reported that older adults across the United States, including in San Diego County, will make up 20% of the population by 2030. With the majority of healthcare services going towards older adults, the growing elderly population may further overwhelm the healthcare system, impacting San Diegans across all ages. Creating a program to help older adults manage their blood pressure can ease the increasing demand for elderly healthcare in years to come.

In this project, I designed the program using a \$250,000 grant that would last me for a year. Using these parameters, I created a budget, program timeline, overview of how the program would run, job descriptions for the hired staff, a flowchart of the participants, quality control measures, measurable outcomes, principles of leadership to run the program, challenges that may arise throughout the program, and a program mission and

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vision.

I created this project with the guidance of my professor, Dr. Charles Matthews.

### 540 1:00 pm 73

#### Does the Self-Reported Healthcare Access and Health Literacy Predict Concussion Care Seeking?

**Annaliese Andersen, Masters of Science in Athletic Training (M)**

**Context:** Many individuals who sustain a concussion fail to seek care for a variety of reasons. One may be that the individual does not have access to healthcare or high understanding of health-related information. The purpose of this study was to determine if an association exists between access to healthcare and health literacy to concussion care seeking behavior.

**Methods:** As part of a larger cross-sectional study, we administered a 39-item survey to collegiate athletes. The survey measured five social determinants of health domains (SDoH), however this abstract focuses on access to healthcare and health literacy. Participants self-reported five-items related to access to healthcare (2-items; higher score equals worse SDoH), access to primary care (2-items; higher score equals better SDoH), and health literacy (1-item; higher score equals better SDoH). We also included the measures of concussion care seeking intentions (12-items; responses averaged) and behavior (10-items; "care seekers" and "non-care seekers"). Both care seeking intentions and behavior were assessed with indirect and direct measures. Higher scores indicate more favorable intentions. Four separate multivariable regressions were calculated to determine the associations between predictor variables (access to healthcare, access to primary care, and health literacy) and care seeking intentions (two linear regressions), and behavior (two logistic regressions).

**Results:** Two hundred and eleven participants fully completed the survey (completion rate=211/239, 88.3%; age=19.7±1.6 years; male=95/239, 39.7%, females=111/239, 46.4%, intersex=1/239, 0.4%, androgynous=2/239, 0.8%, other=1/239, 0.4%, prefer not to answer=2/239, 0.8%, missing=27/239, 11.3%). For every one-point increase in health literacy ( $\beta=0.26$ ,  $p=0.023$ ), direct intentions increased by 0.26 (overall model:  $F_{3,191}=3.066$ ,  $p=0.029$ ,  $R^2=0.214$ ). Health and healthcare did not predict concussion care seeking indirect intentions ( $p=0.775$ ) nor behavior (indirect:  $p=0.095$ , direct:  $p=0.926$ ).

**Conclusions:** Increasing one's ability to find, understand, and implement concussion-related information, may impact concussion care seeking intentions. While access to healthcare and health literacy were not associated with care seeking behaviors, our sample included collegiate athletes who often have access to an athletic trainer. Additionally, our health literacy measure with one-item may not fully capture health literacy holistically. Future research should examine access to healthcare in other populations and health literacy with expanded measures.

### 541 1:00 pm 74

#### Community-Based Human Papillomavirus Vaccine Education

**Kacie Wass, Masters of Science in Nursing Leadership (M)**

In San Diego County, per the most recent Random Digit Dialing survey performed by Public Health Services, only 50.7 % of San Diegans aged 11-17 are up to date with their HPV vaccine series (RDD, 2023). Unfortunately, many cervical, anal and vulvar cancers develop from exposure and infection with Human Papillomavirus'. Around 47,199 HPV-related cancers occur in the United States annually (HPV-Associated Cancer Statistics | CDC, n.d.).

**Aims:** This evidence-based practice (EBP) project aims to address low Human Papillomavirus (HPV) vaccination rates and understand the influencing factors affecting preventative health behaviors in the San Diego community through a comprehensive, community-based outreach intervention.

**Study design:** Non-experimental pre and post-test designed study

**Methods:** This evidence-based intervention was implemented at a community health fair and 16 adults participated in both the manually administered Pre and post-tests. The study included printed educational materials on the HPV vaccine along with an informal poster presentation on common fears and misconceptions surrounding the vaccine. Both interventions were aimed at promoting vaccination. Adopting the Health Belief Model as a conceptual framework, the intervention considered, modifying factors such as age, gender, education, income, etc. understanding how these factors interact with individuals' beliefs to influence behavior and action. Pre and post-tests were manually administered via print before and after the educational interaction. Data collected from test answers were categorized into three categories; individual factors, Beliefs, and Intention for Action.

**Results:** Should provide numerical findings. The category most influenced by the intervention was intent for action, exhibiting a significant increase of individuals highly likely to vaccinate themselves and their children/ grandchildren. There was a notable 21.3% increase in intent to vaccinate self, and an even larger 39.2% increase in intent to vaccinate a child or grandchild. Knowledge of symptoms of HPV and its effects increased from a 32% correct answer rate to 81.2% correct answer rate on the Post-tests.

**Conclusions**

Preventative health behaviors can be influenced through meaningful interactions and outreach by community health workers and students, which can ultimately prevent disease.

### 542 1:00 pm 75

#### The Effect of Hands-on Cooking Classes on SDSU Student's Ability to Navigate Barriers to Cooking Healthy

**Melanie Reilly, Master of Public Health (M)**

This project aims to mitigate the barriers that college students

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face in cooking nutritious meals. It will examine the impact of additional educational components to the established Cooking Healthy Eating Fresh (CHEF) curriculum to support students' ability to cook nutritious meals despite the barriers they face as college students. CHEF is a culinary nutrition program that provides experiential learning through hands-on cooking classes. These classes will take place on San Diego State University (SDSU) campus in the Well-Being and Health Promotion (WBHP) department. The population of focus is students at SDSU. The project will build off a previous outcome evaluation of the CHEF curriculum's effectiveness in addressing food agency principles among college-aged individuals. The evaluation identified two main barriers impacting students' ability to prepare nutritious meals: shared kitchen spaces and time constraints. This project will address those barriers by adding educational components to the CHEF classes to provide evidence-based strategies to mitigate the identified barriers. An evaluation will be conducted to assess preliminary evidence of impact.

A multi-methods approach will be used for data collection and analysis. Data collection will occur through a pre and post-survey. Qualitative data will be collected through photovoice. Participants will take pictures of their cooking experiences after participating in the CHEF class and explain how the class has affected their ability to cook nutritious meals. The photos will be analyzed to identify themes suggesting CHEF classes' impact on students' ability to mitigate cooking-related barriers.



# Abstracts of Presentations

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## Session I

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(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## Session I-1

Behavioral and Social Sciences 1

Friday, March 1, 2024 3:00 pm

Montezuma Hall

### 543 3:00 pm 1

#### Indigenous Agroforestry and Fire Management in Thailand and the United States

**Joaquin Rafael Ramoso, Bachelor of Arts in Interdisciplinary Studies (Sustainability, Political Science, Psychology) (U)**

Indigenous communities around the world have sustainably managed natural resources and protected forest environments for generations through traditions including agroforestry and controlled burning. However, dominant land management discourses often ignore or misunderstand the ecological value of these customs. Government officials claim that policies like national park demarcation and fire suppression practices are environmentally friendly, but these pose significant threats to ecosystem health and to Indigenous communities' ability to preserve their traditional livelihoods. Given the urgency of the climate crisis – particularly regarding the increasing frequency and severity of wildfires, industrial agricultural pollution, and food insecurity – there is a dire need to more deeply understand and appreciate Indigenous ecological knowledge. By integrating this local wisdom into environmental policy and empowering Indigenous peoples in the decision-making process, communities can effectively protect both ecosystems and Indigenous rights.

This research project compares the experiences of the Indigenous Karen hill tribe in northern Thailand with Native tribes throughout California who also practice agroforestry and controlled burning. It examines numerous challenges and victories these groups have experienced while interacting with their respective governments. Data was collected through group interviews, participant observation, and analysis of journalistic and academic articles. Results are discussed.

### 544 3:00 pm 2

#### Pandemic-Related Disruptions to Childcare and English-Spanish Bilingual Language Acquisition

**Melisa Gonzalez, Bachelor of Arts in Psychology (U)**

Acquisition and retention of Spanish in bilingual children in the United States may occur first through exposure from Spanish-speaking caregivers (Surrain et al., 2018) whereas English acquisition may rely more on exposure to outside settings. Increased chaos at home due to the COVID-19 pandemic may have interrupted this exposure pattern (Gassman-Pines et al., 2020). With 70% of childcare centers closed (Lee and Parolin, 2021), children may have spent more time with Spanish-speaking caregivers, resulting in greater Spanish exposure. Simultaneously, less interaction outside the home may have reduced English exposure. A study of English-Mandarin bilingual children found that pandemic disruption to the school setting (where English is spoken)

improved Mandarin, relative to English production (Sheng et al., 2021). This suggests that more time at home during the pandemic may have benefited native language proficiency (with a corresponding reduction in English proficiency) relative to children who remained in outside settings.

Of interest is the effect of pandemic disruption on bilingual acquisition of Spanish and English. Our preliminary sample includes 13 bilingual children (M = 32.46, range = 20 to 40; 5F) whose parents completed the COVID-19 Family Stressor Scale (Prime et al., 2021), focusing exclusively on the childcare sub-scale. Six children received substantial Spanish exposure at home (M = 74.29, range = 56.25 to 87.5) and seven received 50% or less (M = 39.8, range = 25 to 50). Partial correlations controlling for age suggest childcare disruption is marginally negatively associated with English vocabulary scores ( $r_{10} = -.519, p = .084$ ) but not with Spanish ( $r_{10} = .177, p = .582$ ). Descriptively, children with disrupted care ( $n=5$ ) had lower average English vocabulary scores than children with uninterrupted care ( $n=8$ ;  $M=19.8$  and  $23.625$ , respectively), and higher Spanish scores than children with uninterrupted care ( $M=27.4$  and  $23.125$ , respectively). Two children who experienced disruption received substantial Spanish exposure at home (73 and 80%, respectively) whereas three children were minimally exposed (<27%). This contributes to variability in the effect of disruption on Spanish vocabulary. Data collection is ongoing. We anticipate presenting data on 55 participants with power = .8 to detect a medium effect.

### 545 3:00 pm 3

#### The Role of Socioeconomic Factors on the Effectiveness of an Integrated Care Intervention among Latino Adults: the LUNA-D study

**Rivera Adriana, Bachelors of Arts in Psychology, minors in Counseling and Social Change, Child and Family Development (U)**

##### Background

Latino adults exhibit a disproportionate rate of type 2 diabetes (T2D), which is exacerbated by poor glycemic management. A culturally tailored, integrated care intervention, LUNA-D, was shown to improve glycemic management among Latino adults with T2D. However, it is unknown whether all participants benefited equally from the intervention. Studies suggest that socioeconomic factors, such as employment status and education, may influence the receptivity to interventions. There is limited research on the moderating role of socioeconomic factors on intervention effectiveness among Latino adults.

##### Purpose

To examine whether intervention effectiveness on HbA1c differs by educational attainment, annual household income, or employment status among Latino adults with T2D over six months.

##### Methods:

A randomized controlled trial (2015-19) was conducted at a federally qualified health center. Participants were 456 adults, aged 23 to 80 years, with T2D and not using insulin. Participants were randomly assigned to an Integrated Care

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Intervention (ICI), which comprised visits with behavioral/mental healthcare, medical care, health education, and care coordination or to Usual Care (UC) over six months. Educational attainment, annual household income, and employment status were tested as potential moderators of intervention effects by including each factor in separate 3-way Intervention Group x Time x Socioeconomic Factor interactions on HbA1c.

Results:

The mean age of participants was 55.7 years, and 63.7% were female. Most participants had no high school diploma or equivalent (70.6%), reported a household income  $\leq$  \$20,000 (66.8%), and were unemployed, retired, or had a disability (56.7%). In multilevel model analyses, all 3-way Intervention Group x Time x Socioeconomic Factor interactions on HbA1c were not significant ( $P_s > .05$ ).

Conclusion:

As previously reported, the ICI group showed a significant decrease (vs. no change in the UC group) in HbA1c over six months. Results did not differ by educational attainment, household income, or employment status. Our findings suggest that culturally tailored, integrated care interventions may be effective for low-income Latino adults with T2D regardless of socioeconomic factors. LUNA-D was limited to low-income persons; thus, future studies should examine the role of socioeconomic factors on intervention effectiveness among socioeconomically diverse populations.

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### 546 3:00 pm 4

#### Who am I? American Indian Youth

**Jonathan Zepeda Rodriguez, Bachelor of Science in Criminal Justice (U)**

The study aims to understand how American Indian youth describe themselves in the AIR Programs. The American Indian Recruitment (AIR) Programs is a non-profit organization serving Southern California's Tribal and Urban American Indian communities to promote higher education and guidance. Using a survey, 73 students provided detailed responses, ranging from hobbies to academic interests. Analyses included merging student responses conducted between 2018-2020 and coding them into categories. The study found the responses to be centered around five themes: Cultural Pride, Aspirations, Activism, Wellness, and Family Relationships. Students reflected on their future career interests and showed a desire to pursue higher education. Findings and themes are discussed.

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### 547 3:00 pm 5

#### Investigating Processing Speed in Aphasia

**Elizabeth Brownlee, Speech, Language, and Hearing Sciences (U)**

Aphasia is an acquired language disorder, typically caused by a stroke, which impacts speaking, writing, reading, and comprehension. One common symptom of aphasia is difficulty with word finding, or word retrieval deficits. Researchers have suggested that word retrieval deficits in aphasia may be connected to a domain-general deficit of processing speed,

resulting in slower access to words and delayed naming response times (Faroqi-Shah & Gehman, 2021). Processing speed can be defined as the speed at which a person can understand and react to the information they receive. Researchers have found that domain-general processing speed is slowed in people with aphasia (Yoo et al., 2022). Processing speed delays may contribute to the mistiming of word network activation and could derail word retrieval (Faroqi-Shah & Gehman, 2021). Therefore in this study, we explore whether people with aphasia (PWA) show impaired processing speed, in comparison to neurotypical age-matched control participants (AMC), and if PWA will show differences in processing speed depending on the linguistic variation of the stimuli.

We recruited 13 participants in each group ( $N = 26$ ). In this experiment, participants were presented with a rapid stream of letters (i.e., linguistic condition) and shapes (i.e., non-linguistic condition) with varying presentation speeds. All stimuli were presented in black aside from the target (T1) which was presented in white. Participants were asked to identify T1 at the end of each trial by pointing at a response board.

Statistical analyses indicated that the PWA were significantly less accurate at this processing speed task than controls. Additionally, there was a significant effect of stimulus type, such that both groups were more accurate in the linguistic condition than the non-linguistic condition. Further analyses showed a relationship between processing speed and performance on a picture naming task. The PWA with greater accuracy on the processing speed task showed greater naming accuracy.

Our results demonstrate that processing speed is impaired in aphasia, which may be connected to word retrieval deficits. More research is needed to understand how processing speed impacts language processes in aphasia in order to advance aphasia treatments.

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### 548 3:00 pm 6

#### Cervical Cancer Screening Interventions for Indian Women Living With HIV

**Brianna Hostler, Bachelor of Arts in Psychology (U)**

**Purpose** The risk of cervical cancer (CC) for women living with human immunodeficiency virus (WLWH) is far higher than those without HIV. Despite this, only a small percentage of WLWH in India are screened regularly for CC. Few studies have examined the perspectives of Indian WLWH and those who provide services to them regarding the characteristics of interventions that could assist them with getting CC screening. This qualitative study explored and identified the characteristics of interventions that could assist Indian WLWH with obtaining CC screening.

**Methods** 25 WLWH and 15 stakeholders that provided healthcare for the WLWH took part in semi-structured individual interviews in Surat, India. Participants identified various potential intervention methods to assist Indian WLWH in obtaining CC screening.

**Results** Participants suggested small group-based interventions (10-15 women) hosted by a doctor through verbal communication to educate women about CC screening

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and its benefits. Most individuals interviewed agreed that a female interventionist, the interventionist being a doctor or counselor, is preferred. Participants suggested the content of the informational interventions focus on providing detailed information on the increased risks of CC among WLWH and describing the CC screening procedure.

**Conclusion** Findings suggest that group-based informational interventions, delivered by female doctors or counselors, may improve the receipt of CC screening among Indian WLWH. Future studies should develop such interventions to meet the needs of Indian WLWH.

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### 549 3:00 pm 7

#### The Relationship between Cerebral Blood Flow and Language Impairment in Developmental Language Disorder

**Alicia Linsky, Speech, Language, and Hearing Sciences (U)**

Developmental Language Disorder (DLD) is a heterogeneous neurodevelopmental disorder that impacts a child's ability to comprehend and produce language, but is not linked to hearing loss, intellectual disability, or neurological damage. DLD affects approximately 7-8% of children in the US, surpassing the prevalence of other widely recognized neurodevelopmental disorders such as autism spectrum disorders (ASD) and dyslexia (Zablotsky et al., 2019). Despite DLD's prevalence, little is understood about the underlying neurobiological mechanisms of the disorder due to contradictory neuroimaging findings (Abbott and Love, 2023). Nonetheless, growing evidence indicates that structural and functional brain differences are a contributing factor to the language impairments central to the disorder. This study focuses on functional brain differences that impact children's language abilities. The few functional magnetic resonance imaging (fMRI) studies of children with DLD have found varying results for between- and within- group comparisons. This variability may stem from differences in the underlying properties that support brain function. In this ongoing work, we examine an underexplored metric of brain function in DLD, cerebral blood flow (CBF), to investigate whether children with DLD show different CBF patterns compared to age-matched, typically developing (TD) children, and whether there is a relationship between CBF and language abilities in this population. As part of ongoing data collection efforts, 12 participants (10 TD, 2 DLD) between 6-12 years of age have completed behavioral testing and neuroimaging. Behavioral testing includes a battery of assessments testing both linguistic and non-linguistic abilities. Neuroimaging consists of MRI scans at SDSU that includes resting-state pseudo-continuous arterial spin labeling (pCASL) to characterize CBF patterns and a high-resolution structural anatomy sequence (T1-weighted). Preliminary results reveal a pattern of aberrant (increased) CBF in gray matter brain tissue in children with DLD when compared to TD peers indicating an inefficient system. We anticipate including additional DLD data in future analyses using a linear mixed effects model to examine whether there is a relationship between CBF and language assessment scores, especially within language related

brain regions. This research will provide insight into underlying brain function in DLD that may contribute to observed language impairments.

## Session I-2

Behavioral and Social Sciences 2

Friday, March 1, 2024 3:00 pm

Montezuma Hall

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### 550 3:00 pm 8

#### Cross-linguistic Interactions in Bilinguals During Word Retrieval: A Cognate and Noncognate Production Study

**Erica Axtell, Bachelors of Arts: Speech, Language, and Hearing Sciences (U)**

Bilinguals have a unique learning system that can promote parallel activation across languages during naming tasks. Cross-linguistic activation is particularly prominent during the retrieval of cognates (i.e. words that are similar phonetically, orthographically, and semantically across languages; for example, "pantera" in Spanish is "panther" in English). Previous research suggests that bilinguals experience facilitatory effects when asked to retrieve cognates compared to noncognates. However, bilinguals are extremely diverse in terms of language proficiency and cognitive abilities. This study aimed to determine how cognate crosslinguistic facilitation is modulated by linguistic context and language proficiency in bilinguals.

Spanish-English bilinguals (ages 18-40) completed a picture-word interference (PWI) task, during which they named a picture while text was superimposed. The task had six different conditions. In two "identity" conditions, text and picture matched (either matching cognates or matching noncognates). The remaining 4 conditions added text/picture mismatches. Text and picture pairings included unrelated Cognate-Cognate, Noncognate-Noncognate, Cognate-Noncognate, and Noncognate-Cognate combinations. We hypothesized that participants would experience facilitatory effects (i.e., higher accuracy rates and quicker reaction times) in the identity condition and when cognates were present and more effortful retrieval when noncognates were present.

We observed greater accuracy for cognate than noncognate trials in the identity conditions. In the unrelated conditions, accuracy was higher when either the text or picture were cognates vs. noncognates. The greatest cognate facilitation was observed when cognate pictures appeared with cognate text. For noncognate pictures, neither accuracy nor reaction time changed based on whether they appeared with cognate or noncognate text. Finally, participants were faster to name cognate pictures appearing with cognate text compared to noncognate text. These findings suggest that having the two languages co-activated by the presence of another cognate may have facilitated lexical access during cognate picture naming. We will further examine these effects in the context of individual differences in language proficiency. This study is a

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step towards better understanding how language proficiency and processing context can impact bilingual language performance in adulthood.

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### 551 3:00 pm 9

#### Campus Access Fear Mapping

**Flor Calimag, Criminal justice (U)**

##### Problem

How do people view their world in terms of safety and structure? What areas stand out? These, and many other questions, are what we worked to address by having individuals draw cognitive/image maps of the SDSU campus and its structure. What problems are faced for San Diego State University Students when it comes to parking, entering and leaving from the campus structure? The ways we access campus can be an issue for an organization towards our campus structure making it difficult to access campus, leading to missed classes, more time management issues, and unfairness in parking prices etc.

##### Research Strategy

In response, this research reports the findings of human-centered cognitive/image mapping exercises with houseless individuals in San Diego and Los Angeles, based on principles outlined in Kevin Lynch's "Image of the City" (Lynch, 1960). Specifically, this study asked individuals to draw maps (on blank pieces of paper) of their surroundings and daily routines at SDSU, which were then marked with symbols to identify important locations. We then had them mark the important locations on printed maps so we could then geo-code this information. Specifically focused on San Diego State University's campus and the specific parking structure and street routes.

##### Findings

From our review, we have found that there are gender differences in how people view the safety of the SDSU campus environment. We also found that most students struggle in finding parking and have to leave up to an hour early to not only avoid traffic, but to secure a parking spot as not enough are provided. Complaints from students were pretty similar such as closure of the parking structure for main events, and the horrible traffic in order to leave the parking structure.

##### Takeaways for Practice

This work can ultimately help promote a better quality of life for individuals by improving the design and planning for creating a campus environment that feels more secure. This can also help us unite as students in speaking up about constant issues on campus as we all experience parking problems and lack of access to get to campus.

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### 552 3:00 pm 10

#### Thirdhand Smoke in Homes: Fate, Characterization, and Remediation

**Oscar Lopez, Computer science (U)**

Thirdhand smoke (THS), a persistent toxic residue that attaches

itself to various items, for example clothing, toys, furniture, and more. Poses health risks, including respiratory issues and cancer. Its persistence on household materials underscores the vital importance of understanding its impact and implementing targeted remediation measures for individuals and families within indoor environments. In this project, we investigated the accumulation of thirdhand smoke (THS), focusing on nicotine levels by recruiting participants with at least 6 months of indoor smoking history and implementing a multi-faceted approach. A recruitment strategy, participant screening, and a detailed questionnaire ensured robust data collection. Laboratory analysis of collected samples provided quantitative data on nicotine levels. Results revealed correlation between smoking history and neglect of cleaning practices to elevated nicotine levels emphasizing the need for targeted remediation efforts. Our research also uncovered localized high nicotine concentrations under specific furniture items, indicating potential hotspots. The findings underscore the complex dynamics of THS in homes, emphasizing the importance of tailored remediation strategies. We aim to contribute insights into the broader understanding of THS and effective remediation strategies for improving indoor air quality.

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### 553 3:00 pm 11

#### A Tale of Two Buildings: Do Smoking Policies Impact Discarded Waste from Commercial Cigarettes, E-Cigs, and Cannabis?

**Maria Christina Huerta-Avila, Bachelor of Arts in Psychology (U)**

Waste from commercial tobacco, electronic vaping, and cannabis products (TEC waste) is a significant problem in our environment. When discarded on sidewalks, streets, and parks, harmful chemicals are released into sensitive habitats and enter stormwater drains. Cigarette butts are of particular concern because they consist of filters made out of cellulose acetate, plastic fiber that breaks down into microplastics, and the charred remains of tobacco. Cigarette butts are the most littered item in the world. This case study aimed to investigate the amount and type of TEC waste discarded near two adjacent business properties. Building A has a property-wide no-smoking policy except for a designated area for smoking, and Building B allows smoking and has multiple ashtrays located near its entrance. We hypothesized that occupants and visitors to Building A would not fully comply with the no-smoking policy despite its no-smoking policy and that Building B would have more TEC waste than Building A.

##### Method

Using rakes, reptile feeders (tweezers), and plastic cups for collection, trained research assistants surveyed the parking lot blacktop, sidewalks, and landscaped areas surrounding the buildings. All TEC items were photographed, geo-coded, classified, collected, and disposed of using a smartphone app.

##### Results

Surrounding Building A (smoking prohibited), there were a total of 120 cigarette butts and 11 other tobacco products. Surrounding Building B (smoking allowed), there were a total

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of 196 cigarette butts, two other tobacco products, and one cannabis product.

#### Conclusion

No-smoking policies did not eliminate TEC waste improperly discarded. However, they may have lowered the amount of TEC waste. We cannot be sure that the difference in TEC waste is solely due to differences in no-smoking policies. Although the two properties are similar in size and design, they house different businesses, show different foot traffic, and attract different visitors who may differ in smoking behavior. Future studies should examine reasons for disposing of cigarette butts improperly, knowledge of smoking policies, and the impact of landscaping and design. Concerted efforts are needed to educate the public and significantly reduce TEC waste to protect the environment from harmful TEC waste pollutants.

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#### 554 3:00 pm 12

Can community gardens effectively address food insecurity? A Geographic exploration of disparities in garden capacity

**Yasmeen Wael Zubaidi, Bachelor in URBAN STUDIES - PLANNING, DESIGN, AND MANAGEMENT (U)**

Food insecurity remains a pressing global issue, particularly in urban areas where unaffordable and fast food dominate, limiting access to nutritious options and leaving many to wonder where their next meal will come from. In response to this challenge, community gardens have developed as a grassroots solution. While there is an extensive celebratory literature about the benefits of community gardens, there remain questions about their ability to generate produce safely and sufficiently to alleviate food insecurity, particularly in highly urbanized areas. Can community gardens effectively tackle food insecurity while facing challenges such as limited access to land, insufficient resources, pollution, everyday management issues, and lack of community participation? Preliminary evidence gathered across 56 community gardens in the urbanized areas of San Diego County during the fall of 2023 by conducting interviews, engaging in fieldwork, and analyzing soil samples suggests that growers face many obstacles in establishing and maintaining successful gardens.

These challenges are often related to the social and economic geography of the region. For instance, organizations, leadership and organizational motives vary dramatically. A significant number of community gardens are managed by white, college-educated, and relatively high-income people who tend to garden as a hobby rather than a sustainable means of food production. In contrast, others are run by grassroots organizations that follow the principles of food sovereignty and seek to empower marginalized people to alleviate food insecurity. The latter appear to be located primarily in low-income communities of color with large immigrant populations.

In this paper, we will use interviews and audit data to distinguish gardens based on leadership and organizational structure, community participation and sense of belonging, soil quality, and estimates of food production based on plant diversity and

quantity. We will analyze and map these characteristics along with demographic data from the US Census and environmental pollution data from California Office of Environmental Health Hazard Assessment to establish geographic relationships between community gardens' capacity to alleviate food insecurity and the socio-environmental characteristics of the neighborhoods where they operate.

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#### 555 3:00 pm 13

The Power of Support-Giving Increases Risk Perceptions of Alcohol Consumption

**Andrea M. Chavira, Bachelor of Arts in Psychology (U)**

Public advertisements have often used health information to inform the public about the danger of addictive substances, however they are frequently disregarded by the target audience. When people are presented with health information, especially information that goes against their beliefs or behaviors, feelings of threat increase, making it difficult to change perceptions of risk and subsequent preventive health behaviors. Support-giving, defined as behaviors intended to make others feel cared for, address another's need, or prevent a need from arising, may reduce threat and increase risk perceptions for the negative health outcome. Whether support-giving alters risk perceptions has not been investigated in regard to the threat of reading health information. Is it possible for support-giving to increase risk perceptions from reading health information? We hypothesize that support-giving to someone in need will increase perceptions of risk for drinking alcohol, when compared to a control condition. In a between-subjects experiment, 278 participants who currently drink alcohol (M age = 18.84, 78.4% women) were randomly assigned into one of two conditions (support-giving or control) before reading health information about the risks of drinking alcohol, and completing the TRIRISK, a scale that assesses perceptions of risk. In the support-giving condition, participants took five minutes to write a supportive letter to a friend in need and in the control condition, describe their route to school. Throughout the survey, there were important checks that made participants qualify for the final set which included completion and understanding of the writing task, an attention check, and screening for alcohol use. To test hypotheses, data was analyzed with independent samples t-tests. Our results showed that support-giving increased risk perceptions for the health consequences of drinking alcohol compared to control ( $t(179)=2.242, p=.026, d = .333$ ). This means that support giving can increase risk perception which may allow health information to be more accessible. Given that risk perceptions also predict preventative health behavior, support-giving may also be a previously unrecognized way to encourage better health behavior.

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#### 556 3:00 pm 14

More than Soil: Digging Deeper Into the Relationships of Space, Equity, and Policy of Urban Agriculture in San Diego, CA

**Cameron Schilling, Bachelor of Science in Environmental Science (U)**

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

As sustainable food production becomes more culturally salient within North America, and specifically San Diego, it is important to understand how urban planning and zoning policy affect the urban agriculture landscape. While proponents of urban green space often support urban agriculture as a means of increasing food security within vulnerable communities it is important to understand the nuances and historical significance of how policy and urban agriculture interact. There is mounting evidence that low-income communities of color, which have much to gain from improved access to healthy, affordable, and sustainable food, have historically been denied access to safe land.

Through an investigation of relationships between race and income as they relate to soil health this paper hopes to offer an insight into the landscape of urban agriculture in San Diego. This paper attempts to build a framework for solutions to the lack of urban agricultural land availability within San Diego by using a mix of qualitative and quantitative data including gardener interviews, garden audits, surveys, and soil samples from more than 50 community gardens within urbanized San Diego. Using these data, we will document the spatial distribution of community gardens and analyze its relationship to soil contamination in light of historical and current zoning and land use regulations gathered from city and county records. This investigation will identify inequitable pollution burdens on specific communities and will assess current policies, such as Urban Agriculture Incentive Zones (UAIZ), through this lens to suggest changes that improve the efficacy and equity of future community agriculture projects.

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### 557 3:00 pm 15

**Trends in Responses and Recruitment in an Ecological Momentary Assessment Trial Among LGBTQ+ Adolescents Who Use Tobacco, Nicotine, and Cannabis**

**Aona Shigemori, Bachelor of Science in Public Health (U)**

**Background:** Smart-phone enabled mobile applications using Ecological Momentary Assessment (EMA) are an innovative method to address health disparities. The Puff Break research study aims to utilize EMA to collect daily behavior data to better understand tobacco, nicotine, and cannabis use patterns among LGBTQ+ adolescents, ages 14-19, in California. However, determining the optimal time to administer EMA surveys to gather real-time data is challenging, as there is a dearth of evidence about EMA methodology within adolescent populations. The purpose of this abstract is to describe observed trends in the EMA trial responses and study participants to-date, and assess the ideal times to administer EMA surveys via survey completion rates.

**Methods:** EMA survey completion and timing efficiency was analyzed using Microsoft Excel. Using Qualtrics and Microsoft Excel, we summarized the distribution of responses for baseline demographic variables such as age and race to ensure adequate sampling. In addition, via Excel's data functions, we analyzed completion rates among our 16 participants across each time point when surveys are administered across a two-week trial (9AM, 12PM, 3PM, 6PM and 9PM).

**Results :** To date, 16 participants completed the two-week trial. Among the sample, 80% were adults ages 18-19, while the remaining were between 15-17 years old. Over 33% of our participants' sexual orientation was bisexual. Moreover, 60% of our participants identified as white, and about 27% reported that they are Hispanic/Latino/a/x. The 9AM survey had the lowest completion rate of 60.7%, followed by the 12PM, 3PM, 6PM surveys at 76% completion, and the 9PM survey with 75% completion.

**Discussion:** Providing more flexibility for participants in the morning may increase our survey completion rates. Also, updating our recruitment strategies, such as lowering our target age demographics on our social media advertisements, is important as we seek to capture a diverse sample of participants to help inform a mobile-based smoking and vaping prevention tool. These data provide important lessons learned for conducting future EMA research studies among vulnerable populations.

## Session I-3

Biological and Agricultural Sciences 1

Friday, March 1, 2024 3:00 pm

Montezuma Hall

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### 558 3:00 pm 16

**Plant root exudate carbon and nitrogen increase with root mass and can vary among plant families**

**Lydia Duran, Bachelor of Science in Biology with an emphasis in Ecology (U)**

The rhizosphere, the microenvironment directly surrounding a plant's roots, is home to an enormous variety of bacteria, archaea, and fungi. These microbes carry out important ecological functions and rely on diverse metabolic substrates such as root exudates, organic compounds released from plant roots. However, little is known about how root exudates vary among plant species or if their production is determined by plant size. We raised 37 prairie plant species in sterile conditions and collected root exudates and root dry mass for each plant. We compared the total organic carbon (TOC) and total nitrogen (TN) content of collected exudates to root biomass to determine how they varied with plant size and among plant families. Plants with larger root masses had higher TOC and TN in exudate samples. We separated plants by families and found that plants from all families produced similar amounts of exudate C, but plants from the sunflower (Asteraceae) and legume (Fabaceae) families produced more exudate N. These results suggest that larger plants with greater rootmass may have a stronger influence on soil microbial community structure. While microbes relying on C-rich substrates will benefit from living in the rhizosphere of larger individuals of any of these plant families, microbes that require N-rich substrates may be more enriched in the rhizospheres of asters and legumes.

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

**559 3:00 pm 17****Transposon mutagenesis strategy to discover lipopolysaccharide mutants****Shivani Mahesh, Bachelor of Science in Biology - emphasis in Cellular and Molecular Biology (U)**

Marine bacteria are known for their strong metamorphosis-inducing capability in tubeworms, sea urchins, and coral. Of these, Alphaproteobacteria are an ecologically relevant class and strong inducers of metamorphosis in *Hydroides elegans* (tubeworms). Notably, Alphas do not use any known mechanisms of metamorphosis induction. We hypothesize that bacterial lipopolysaccharides (LPS) are involved in inducing tubeworm metamorphosis. In this project, we use random transposon mutagenesis as a tool to create bacterial mutants that do not induce metamorphosis. To do this, we conjugate the plasmid (PSC189-chlor) with the Mariner Transposon gene with the *Phaeobacter gallaeciensis*. The mariner gene randomly inserts itself at TA sites within the *Phaeobacter* genome and disrupts its gene expression, creating a transposon mutant. Another innovative strategy we used was the creation of electrocompetent *Phaeobacter* to directly electroporate the mariner transposon plasmids. This will allow a streamlined screening method to discover LPS mutants. As a selection strategy, we are employing a dye, Congo Red, to detect abnormal LPS structures. The mechanism behind this is that normal LPS structures bind the dye well and turn red whereas abnormal structures appear as pale red. The results of this project will help uncover novel mechanisms Alphaproteobacteria use to induce metamorphosis in *Hydroides*. This will also allow us to identify structural distinctions in lipopolysaccharide structures of normal and mutated transposon strains, giving us greater insight into how these structures are linked to *H. elegans* metamorphosis. Analyzing these structural mutations can help further the understanding of several invertebrate variations through genetic manipulation in transposon mutagenesis.

**560 3:00 pm 18****Mechanistic Insights into *Bordetella atropi* Resistance in Wild Nematodes****Dylan Matloub, Biology: Emphasis in Cell/Molecular (U)**

Natural variation to pathogens among host species is necessary for evolution of resistance. By understanding this variation, complex mechanisms underlying the evolution of resistance in host species can be identified. This provides valuable insights into the dynamics of host-pathogen interactions and facilitates the development of more effective strategies in infectious disease management. Our lab identified *Bordetella atropi*, a natural bacterial pathogen, that can infect the intestine of the nematode *Oscheius tipulae*. This bacterium can utilize filamentation (conversion to long threads) for spreading between host intestinal cells. In our investigation involving a variety of wild isolates of *O. tipulae*, we observed a spectrum of natural resistance and susceptibility to *B. atropi* infection. Notably, the wild strain JU457 demonstrated the highest resistance to intracellular bacterial infection. Based on this data,

we hypothesize that the resistance of this host strain may be due to enhanced immunity, potentially enhanced mechanical elimination of bacteria in the pharynx before reaching the intestinal lumen, or the release of specific antimicrobial enzymes into the intestinal lumen as a defense. To test this hypothesis, we will conduct a live versus dead assay that will allow us to quantify the percentage of live *B. atropi* bacteria versus dead in JU457 compared to the control nematode strain CEW1, which is highly susceptible to *B. atropi* infection. This assay utilizes fluorescent in situ hybridization (FISH) to quantitatively measure live bacterial colonization in the gut lumen. If our hypothesis is correct, we expect to see less live bacteria in JU457 compared to CEW1, suggesting the potential secretion of immune factors into the intestinal lumen as a defense mechanism. To further test our hypothesis, we will compare the lifespans of JU457 and CEW1 in the presence and absence of *B. atropi*. If our hypothesis is correct, we expect JU457 to outlive CEW1 with the presence of this bacterial pathogen affecting the lifespan of the susceptible isolate. These focused investigations combined with our awaited bulk segregant analysis data will strengthen our belief that the JU457 strain possesses heightened genetic immunity to *B. atropi* infection, as well as contribute valuable information to our broader understanding of nematode defense mechanism and host-pathogen interactions.

**561 3:00 pm 19****Histological Assessment of Vaping-Induced Cardiopulmonary Injury****Sophie Rokaw, Bachelor of Sciences, Biology (U)**

Vaping is rising in popularity among “never-smokers”, specifically young people who continue to use e-cigarettes at an alarming rate despite attempts at regulation by government agencies. Research is desperately needed to understand how vaping affects the heart and lungs in long-term studies. Our group has modeled human vaping exposure using mice in a controlled laboratory setting via inhalation of vape aerosol. Results from two different vape exposure studies will be presented. First, mice were exposed to vape aerosol with or without nicotine in a whole-body exposure chamber for four hours/day for nine weeks to determine if vaping causes premature senescence in cardiac tissue. Second, mice were similarly exposed for four hours/day for four weeks as described previously, then subjected to myocardial infarction injury with subsequent evaluation of cardiac remodeling influenced by vaping. Following exposure, mice were sacrificed, and hearts were formalin-fixed, then paraffin-embedded for histological analysis. Heart tissue sections were stained with both a Hematoxylin & Eosin (H&E) and Masson's Trichrome stain to visualize structural and morphometric changes. Samples were analyzed on the Keyence BZ-x800 microscope using XY measure and Hybrid Cell Count Analysis. Results showed male mice exposed to vape without nicotine for 9 weeks had significantly increased left ventricular area compared to female mice exposed to vape without nicotine. Compared to non-exposed controls, male and female mice exposed to vape without nicotine for 9 weeks had decreased collagen deposition in the heart, while male and female mice exposed to vape with nicotine had increased collagen deposition in the

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heart. In the infarction study, although vape treatments did not have a significant effect on infarct size all exposure groups and sexes had on average a 5-fold increase in collagen deposition compared to their respective sham controls, validating the injury model. These results show that vaping alters cardiac structure and collagen deposition. Future directions include quantifying collagen specifically in the perivascular region and identifying the underlying mechanism between increased collagen deposition in the heart of nicotine exposed mice. Overall, vaping poses a risk to cardiovascular health and awareness should be spread to young people to discourage them from starting or continuing this dangerous habit.

### 562 3:00 pm 20

Growth kinetics analysis and biochemical composition characterization enable smart culturing of nutritious freshwater *Chlorella vulgaris* biomass to enhance space food

**Nicole Romero, Bachelor of Science in Biology (U)**

The unicellular, freshwater microalga *Chlorella vulgaris* has been considered a favorable candidate for enhancing the nutritional value of functional and sustainable foods due to its high-biomass productivity under various conditions. Recognized for its abundant protein content (>50% w/w), content of both essential and nonessential amino acids, as well as its abundant content of vitamins, minerals, and antioxidants (i.e., carotenoids, polyphenols, and flavonoids), *C. vulgaris* is gaining importance as a healthy and sustainable ingredient for space food within NASA's Artemis project. Resilient against harsh conditions in extreme environments and containing immune-modulating and anti-cancer properties, *C. vulgaris* biomass can improve the nutritional value and the prophylactic properties of freeze-dried foods. This project presents the accurate quantification or proximate biochemical composition analysis of *C. vulgaris* throughout its growth cycle, focusing on total protein (Lowry method), carbohydrate (acid digestion method), lipid (gravimetric analysis), and photosynthetic pigment (cold acetone extraction) content. Biochemical composition data is complemented with the determination of Gompertz-Zwietering growth kinetics parameters (i.e., biomass carrying capacity (A), growth rate,  $\mu_{max}$ , and lag time,  $\lambda$ ) to better understand the dynamic biochemistry of *C. vulgaris* during its reproduction. Furthermore, accurate biochemical composition data is being used for curation of objective biomass equations that enhance the predictive capabilities of high-quality Genome-Scale Metabolic Reconstruction models. Overall trends indicate that protein content decreases over time as *C. vulgaris* cells progress further along in their growth cycle while increasing carbohydrate accumulation over time. Interestingly, the lipid and photosynthetic pigment fractions remained constant at the optimized autotrophic growth conditions in Bold's Basal medium. This quantitative analysis will provide a basis to select the optimal culture age for harvesting the microalgal biomass for astronaut food.

### 563 3:00 pm 21

Determining the Impact of Fibulin 3 on CA19-9-Mediated Pancreatic Ductal Adenocarcinoma Growth, Invasion, and Cell Signaling

**Kassidy Curtis, Bachelors of Science in Cellular and Molecular Biology, Minor in Chemistry and Minor in Interdisciplinary Studies (U)**

Pancreatic ductal adenocarcinoma (PDA) is a lethal cancer with a five-year survival rate of less than 12% and is projected to soon become the second leading cause of cancer-related death. Notably, 95% of PDA cases exhibit KRAS mutations, contributing to highly dysregulated cell signaling networks. Glycosylation is one of the most common types of post-translational modification, and it is a critical determinant of protein function. Levels of the glycan carbohydrate antigen 19-9 (CA19-9) are elevated in the serum of 75% of PDA patients and are used to monitor progression and response to therapy. However, understanding the detailed functions of CA19-9-modified proteins in PDA has been limited due to the lack of adequate models for synthesizing CA19-9. To address this challenge, we have developed unique mouse and 3D organoid culture models capable of producing CA19-9. CA19-9 elevation in mice with KRAS-mutations results in an aggressive PDA phenotype through increased tumor proliferation. Furthermore, our research has identified Fibulin 3 (FBLN3), an extracellular matrix glycoprotein, as a secreted, CA19-9-modified protein that stimulates tumorigenesis. In this study, we found that FBLN3 facilitates tumor growth in both in vitro 2D cells and in vivo. Additionally, we found that FBLN3 drives epithelial-mesenchymal transition (EMT) and promotes STAT3 pathways activation in the CA19-9pos, KRAS-mutant PDA organoids. Altogether, these data suggest significant implications for providing novel insights into PDA biology and paracrine signaling mechanisms, identifying FBLN3 as a potential therapeutic target for the improved treatment of this devastating disease.

### 564 3:00 pm 22

Role of Syncytiotrophoblast-derived extracellular vesicles in providing potential biomarkers for preeclampsia

**Giselle Adeline Cunanan, Bachelor of science in microbiology with an emphasis in clinical laboratory science (U)**

Trophoblasts are specialized epithelial cells of the placenta, and in human there are three subtypes: undifferentiated cytotrophoblast (CTB), and fully differentiated syncytiotrophoblast (STB) or extravillous trophoblast (EVT). During early placentation, STBs cover the surface of placental villi and provide gas and nutrient exchange between the mother and fetus. Extracellular vesicles (EVs) are small, lipid membrane encapsulated structures that carry various biomolecules from the cells that release them. EVs exert their biological functions by delivering proteins, bioactive lipids, and nucleic acids to recipient cells. Therefore STB-derived EVs may have important roles in fetomaternal signaling. Moreover, there is growing

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evidence that the cargo of EVs can reflect the functional state of the source cells, leading to interest in EVs as potential sources of disease biomarkers and as therapeutic vehicles. More specifically, preeclampsia is a pregnancy syndrome characterized by maternal hypertension and proteinuria. Techniques for tracing EVs and their cargo from cells of origin, through biofluids, and into destination cells are critically needed to decipher mechanisms of EV signaling. EV membranes are highly enriched in tetraspanins, a family of proteins with four transmembrane domains that are often used for EV capture and classification. There are optimized methods for multiplex vesicle flow cytometry (vFC) of EVs released by placental explants using antibodies against the tetraspanins CD9, CD63, and CD81. However, placental explants are comprised of several cell types, and thus release a mixed population of EVs. In this study, we aim to characterize the tetraspanins expressed on EVs released specifically by STB. For this, I will differentiate in vitro trophoblast stem cells (TSC) in order to generate a homogeneous STB population. STB differentiation will be verified by checking for the markers: EGFR, HLAG, and ITGA1 via flow cytometry. The next step of the project will involve differentiating TSC into STB, performing vFC on cell culture supernatant, and analyzing EV cargo.

## Session I-4

Education

Friday, March 1, 2024 3:00 pm

Montezuma Hall

565 3:00 pm 23

Soy de Aquí y Soy de Allá: Exploring Transfronteriza College Students' Sense of Belonging at the Imperial Valley-Mexicali Borderlands

Alexia Reyes, English (U)

The Transborder Scholar Collaborative (TSC) at SDSU-Imperial Valley is dedicated to the social justice of Transfronterix students in education along the U.S.-Mexico borderlands. As Transborder Scholars we are committed to implementing critically conscious research and practices through liberatory methodologies centered on the holistic student development of our Transfronterix community in education. We are dedicated to fostering the success of Transfronterix students through an interdisciplinary approach to research and practice in education and transborder studies. Informed by our research we prepare critically conscious border educators and implement student centered initiatives in education at the U.S.-Mexico borderlands.

In this session we will present the preliminary findings of our photovoice collaborative autoethnography study titled, Soy de Aquí y Soy de Allá: Exploring Sense of Belonging at the Imperial Valley-Mexicali Borderlands. The purpose of this study is to illustrate the complexities of transborder identity development by exploring our sense of belonging experiences in higher education, community and families at the Imperial Valley-Mexicali Borderlands. In this photovoice

collaborative autoethnography we are applying liberatory and decolonial methodologies as delineated by Chicana Feminism methodologies (Delgado Bernal & Elenes, 2011), while triangulating with visual methodologies. Altogether, these methods allow us to reminisce, reimagine, explore, and reflect on critical moments that shaped our experiences in education at the Imperial Valley-Mexicali borderlands. At the TSC, we are engaging in these methods through weekly collaborative autoethnography photovoice sessions. The preliminary findings of our research revealed the intersections of our transborder interactions and gender as we learn to love our identities on both sides of the U.S.-Mexico border.

Beyond a research collaborative, the TSC is a space of inclusion, cultural validation and multigenerational mentorship for Transfronterix students at SDSU-Imperial Valley. As such, TSC has provided the students of this study a platform as Transborder Scholars and mentorship opportunities with the TSC Founding Director.

566 3:00 pm 24

Examining the Interaction Between Teachers and their Students in Head Start Classrooms

Victoria Rietz, Bachelor of Science in Child Development & Bachelor of Arts in Journalism with an Emphasis in Media Studies (U)

Teachers play a critical role in the quality of education children receive in school. The role of teachers is particularly critical during children's preschool years because this is when they are developing the foundational skills that will shape their lifelong academic and socioemotional wellbeing. In comparison to later grades, preschool classrooms are a unique learning environment because there are usually between two and three teachers in each classroom, a small number of children, and the learning curriculum is usually center and play-based. These unique preschool characteristics likely create a unique dynamic between teachers that shapes the learning opportunities they provide children. However, few studies, till date, have explored the dynamics between teachers in preschool classrooms. Therefore, this study aims to describe the dynamics between Head Start teachers with each other and the children within their classrooms. In total, 10 Head Start teachers within five classrooms participated in this study. Teachers were video recorded in their classrooms engaging in their usual activities. Videos were transcribed and coded. Preliminary findings indicate that there are differences across classrooms in the dynamic between teachers within the classroom. Specifically, in some classrooms one of the teachers assumes the primary role as instructor while the other teachers supports her role by redirecting children to the main teacher, cleaning the class, and preparing materials for the activities. In other classrooms, both teachers take more of an active role in engaging with children. These findings have the potential to shed light on the learning opportunities provided to children in low-income preschool classrooms.

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**567 3:00 pm 25****Predictors of accuracy in Spanish reading comprehension in bilingual school-aged students****Lilly Arellano, Speech, Language, and Hearing Sciences (U)**

INTRO: Home environment and educational programs play a significant role in dual language learners' (DLL) Spanish literacy skills. Studies demonstrate that when early instruction is given in the first language (L1) (e.g., dual language [DL] programs), children demonstrate literacy skills within normal limits in both L1 and their second language (L2). Children from Spanish-speaking homes who are immersed in English-only education generally perform on par with their peers in DL instruction on English literacy outcomes; however, this comes at the cost of L1 oral language and literacy skills. In order to further understand the biliteracy development of DLLs, we will examine factors potentially contributing to students' reading comprehension scores, including the word frequency of the answer choices, the length of the passage, the students' home language exposure, and the educational context (dual language vs. English-only education).

METHODS: We examined responses to a computerized Spanish reading comprehension assessment created in our lab, Leyendo para Comprensión (LPC). 150 second graders and 125 third graders (82% of whom were in dual language classrooms), read increasingly difficult passages with a missing word, to which they were asked to choose the correct target from three options. Children also completed a researcher-administered questionnaire about their home and school language use.

RESULTS: All responses completed in fewer than five seconds were removed before analyses. A logistic regression revealed that the factors of interest all significantly predicted the likelihood of a child answering our Spanish reading comprehension questions correctly. Children in dual language education ( $B=.52, p<.001$ ) and children with more Spanish exposure at home ( $B=.41, p=.05$ ) were more likely to answer questions correctly. Additionally, shorter items ( $B=-0.02, p<.001$ ) and items where the correct answer choice was a higher frequency word ( $B=.00, p<.001$ ) were more likely to have correct answers

Conclusions: Increasing Spanish exposure at home and providing access to bilingual education may help to improve Spanish literacy outcomes. When examining the results of reading comprehension tests, teachers should take into account the length and complexity of the vocabulary in the passages included in the test.

**568 3:00 pm 26****The Impact of Spatial Skills in a Mid-Major Computer Science Course****James Marsh, Computer Science (U)**

A growing body of past studies suggests that spatial activities and computer science tasks may target the same cognitive processes within the brain. Spatial skills refer to the ability to reason, understand, and transform the spatial relations among objects in space. Additionally, research has revealed

a connection between strong spatial skills and success in computer science. It has been demonstrated that training spatial skills can enhance a students' spatial abilities, which should in turn lead to more competency in computer science concepts, particularly in introductory computer science and engineering courses. However, it's noteworthy that there is a lack of research exploring the impact of spatial skills training on students enrolled in more advanced courses. Our research delves into this intersection of spatial activities and computer science performance, seeking to unearth the impact of spatial skills training on students' academic outcomes. The study focuses on a course teaching software engineering principles, and includes two sections of the course, with one serving as a treatment group and the other as a control group. In both groups, we administered spatial skills and computer science assessments to establish the students' baseline knowledge. The treatment group received spatial skills training through written workbook modules accompanied by quizzes. Meanwhile, the control group received more course-related activities to control for time-on-task between the two sections. Upon completing these activities at the end of the semester, a post assessment was conducted in each section to evaluate any improvements in their spatial skills and computer science knowledge. The comparison of the pre- and post-test results showed no significant improvement in spatial skills and computing knowledge between the treatment and control groups, indicating that the integrated spatial skills had no measurable effect. This conclusion indicates that future iterations of this research should first focus on establishing a baseline of students' spatial abilities in order to determine the potential effectiveness of a supplemental intervention.

**569 3:00 pm 27****Light in the Darkness: Education for Afghan Women****Wahida Hammad, ISCOR (U)**

Gender policy analysis can highlight gender inequalities in education, particularly for girls and women facing patriarchal norms. I explore this argument by taking a gender-based approach to examining inequalities in societies in Afghanistan, a developing and fragile state, and in the U.S., a developed nation that welcomes refugees, including girls and women from Afghanistan. In a patriarchal society, gender roles are more rigid and limit girls and women in terms of their educational and economic opportunities. Afghanistan is, like many societies, patriarchal in many households and governance. In addition, Afghan refugees coming to the U.S. are disadvantaged by the legacies of gender inequality from Afghanistan and may continue to experience gender or other barriers in the U.S. lifestyle and societal norms. After presenting my findings on Afghanistan and the U.S., I provide recommendations for moving forward in Afghanistan and for Afghan refugees in the U.S., focusing on women's education.

**570 3:00 pm 28****Exploring Educational Perspectives: A Study on Latine Students' Academic Performance Factors in**

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

## High Schools

### **Dennise Bell, Interdisciplinary Studies in Three Departments (U)**

Research has found that low-income, Latine students are among the group of students in the United States with the lowest levels of academic achievement. These low rates of educational attainment have been largely attributed to the disparities in access to high quality schools and formal learning opportunities available to them. Among Latine students from low-income households, those who have limited or no proficiency in English receive even less access to educational resources and support from their school. To date, however, little is known about how Latine students with different levels of English proficiency experience their educational journey from their perspective. Additionally, both teachers and counselors play a critical role in the educational experiences of Latine students, yet few studies have incorporated their perspectives. This qualitative study will conduct semi-structured interviews with Latine students in high school who possess different levels of English proficiency to compare the factors that they perceive contribute to their academic performance. Furthermore, high school teachers and counselors within the same high school will also be interviewed to understand their perspectives on the factors that shape the educational experiences of Latine students with different levels of English proficiency. Findings from this study have the potential to provide a more in-depth and complete understanding of the educational experiences of linguistically diverse Latine students. Moreover, these findings might shed light on the types of experiences that contribute to differences in academic performance among students with different levels of English proficiency.

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**571 3:00 pm 29**

**Critical analysis of an undergraduate minor: curriculum alignment for the multicultural learning and working environment**

**Shaye Phung, Bachelor of Arts in Liberal Studies (U)**

Using critical analysis as the primary form of research, the undergraduate student Program Development Assistant will research the impact of an undergraduate minor they are employed to support as a federal work-study recipient. The focus on cultural competency in professional practice poises students enrolled in this minor to apply learning in general education and prerequisite courses, ultimately preparing for dynamic and diverse workplace environments. This critical analysis will focus on the detailed explanation and evaluation from a subjective view, evaluating the current state of course offerings and the intention to support multicultural professional skill development needed for post-graduate career readiness and graduate-level coursework. Critical analysis of the current program from an undergraduate student research perspective will amplify the student voice while maximizing program development through a student researcher perspective. The researcher will include the impact of career development opportunities as a student employee.

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**59 3:00 pm 72**

**The Henrietta Goodwin Scholars Program and its Influence on Academic Success among African American Students at San Diego State University**  
**Christaysha McDowell, Bachelor of Arts in Psychology (U)**

This comprehensive qualitative study delves into the impact of the Henrietta Goodwin Scholars (HGS) Program on African American/Black students at San Diego State University. The abstract highlights the program's design, methodology, and significance in fostering academic success, inviting readers to explore its relevance in supporting the transition and achievements of underrepresented minority students in higher education. The research specifically aims to assess how the program's emphasis on support structures and mentorship influences the academic success and transitional experiences of African Diaspora students at San Diego State University. Through an exploratory qualitative approach, surveys are conducted with a number of current and past program participants to gain insights into the multifaceted ways in which the HGS Program contributes to the academic journey of African American/Black students. By exploring the effectiveness of the program, this research provides valuable insights to the field of higher education, particularly in enhancing support programs for underrepresented minority students. Understanding the impact of targeted initiatives on academic success and transition is crucial for informing the design of programs that aim to support diverse student populations.

## **Session I-5**

Behavioral and Social Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

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**572 3:00 pm 30**

**Social support and cancer screening completion among patients in a Federally Qualified Health Center in San Diego, California**

**Kiria Gabriela Fraga, Joint Doctoral Program in Health Behavior (D)**

Introduction: Regular cancer screening is critical for early detection and treatment. Yet, national cancer screening completion rates remain low (67% for colorectal, 66% for breast, and 68% cervical), particularly among minority populations such as Latinos. Social support can contribute positively to cancer screening behaviors. Understanding the role of social support in cancer screening may help inform effective interventions to increase uptake of cancer screening when available. This study examined the association between perceived social support and cancer screening completion among patients from a Federally Qualified Health Centers (FQHC) in San Diego, California.

Methods: This was a cross-sectional study and data on cancer screening completion were extracted from electronic health

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records of 116 patients. Sociodemographic data were collected via a comprehensive self-administered survey. Total social support ( $\alpha = 0.82$ ) was measured via the Interpersonal Support Evaluation List-12 (ISEL-12) which includes dimensions for appraisal ( $\alpha = 0.65$ ), belonging (0.62) and tangible support (0.57). Associations between overall social support (continuous independent variable) and recommended cancer screening completion for colorectal, breast and cervical (classified as yes vs. no) were analyzed using logistic regression, adjusting for age, sex and ethnicity.

Results: Patients were 45.6% Hispanic, 66% female and mean age of  $44.7 \pm 14$  yrs. The average ISEL-12 score was  $19.10 \pm 4.9$ . For cancer screening, 69%, 73%, and 63% were up-to-date with breast, cervical and colorectal cancer screening, respectively. There was no association between overall perceived social support and cancer screening completion (OR = 1.0; 95%CI: 0.9-1.1). However, female patients had greater odds of completing cancer screening compared to male patients (OR = 8.6; 95%CI: 3.1-24.1). Furthermore, Hispanic women had 75% lower odds of completing breast cancer screening compared to non-Hispanic women (OR = 0.25; 95%CI: 0.06-0.98).

Conclusion: There were no associations between overall perceived social support and completion of cancer screening among patients. However, there were sex and ethnicity differences in cancer screening completion supporting the need for further research in these subgroups and the role of social support.

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### 573 3:00 pm 31

#### Combining ApoE Status and Olfactory Performance Predicts Alzheimer's Pathology Biomarkers

**Conner Frank, PhD Clinical Psychology (D)**

Changes in identification, memory, and perceived familiarity of odors are early risk factors for Alzheimer's Disease (AD; Murphy, 2019). Less is known about the relationship between olfactory performance and biological risk factors, such as the Apolipoprotein E  $\epsilon 4$  allele and the presence of amyloid and tau in cerebrospinal fluid measurements (CSF; Simonsen et al., 2017; Serrano-Pozo, 2021). To understand the interaction between olfactory performance and AD biomarkers, 32 older adults completed the San Diego Odor Identification Test (SDOIT), the Alzheimer's Disease Assessment Scale – Cognitive Subscale (ADAS-Cog), and measures of odor familiarity and correct odor recognition memory (hits). Participants were also genotyped for the presence of an  $\epsilon 4$  allele and completed a lumbar puncture, from which indicators of amyloid and tau pathology were extracted. The effects of the interaction between  $\epsilon 4$  allele presence and both the number of odors correctly recognized (hits) and a SDOIT/odor familiarity composite on CSF Amyloid-Beta 42 (Ab42), phosphorylated tau (p-tau), total tau (t-tau), and t-tau/Ab42 ratios were assessed using multiple linear regression, controlling for age, sex, years of education, and ADAS-Cog scores. The interaction between hits and  $\epsilon 4$  status predicted p-tau ( $\beta = -49.7$ ,  $p > .001$ ), t-tau ( $\beta = -330.91$ ,  $p > .001$ ), and t-tau/Ab42 ratios ( $\beta = -.63$ ,  $p = .0047$ ), with  $\epsilon 4$  carriers with a low number of hits showing the highest

CSF biomarker burden. Similarly, the interaction between the odor identification/familiarity and  $\epsilon 4$  status predicted p-tau ( $\beta = 7.25$ ,  $p = .025$ ), t-tau ( $\beta = 59.68$ ,  $p = .0036$ ), and t-tau/Ab42 ratios ( $\beta = .11$ ,  $p = .037$ ), with  $\epsilon 4$  carriers with high levels of the identification/familiarity composite showing the most elevated biomarker levels. The results imply that the combination of genetic and olfactory risk can predict the onset of biochemical changes in the brain related to AD pathology. These results also imply that, in  $\epsilon 4$  carriers, worse recognition memory for odors may have particular relevance for predicting AD risk in those at genetic risk for AD. Supported by NIH grant #R01AG062006 to CM.

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### 574 3:00 pm 32

#### Building Resilience to Climate Change Impacts through Community Engagement in Water Management: A Comparative Study of California and Baja California

**Andrés Peñalosa Reyna, Masters of Arts in Geography (M)**

This project investigates groundwater management in California, United States, and Baja California, Mexico. Research emphasizes the need to enhance resilience to climate change through improving water infrastructure, resource management, and community participation. Two case studies, Tulare Lake Basin in California and Maneadero Valley in Baja California, were conducted through collaborative, transborder, research focusing on the role of community involvement in groundwater management. These two case studies are characterized as experiencing stress factors associated with urban growth, agriculture, and increases in drought. These circumstances have led to higher demand for groundwater sources, resulting in scarcity, depletion and pollution of aquifers. Researchers conducted a thorough review of existing literature and completed twenty four semi-structured stakeholder interviews. Baja California interviews highlight urban water management, limited community participation is linked to government restrictions, and declining financial resources for water management. California interviews highlight rural water management, representation of disadvantaged communities under the Sustainable Groundwater Management Act (SGMA), the importance of education and information access, and the need for active community engagement in groundwater management. Both case studies show that concerns about climate change resilience are primarily tied to its impacts of prolonged droughts, erratic rainfall, and water quality on agricultural production. The project aims to address opportunities and challenges about the importance of participatory approaches in climate resilience and sustainable water resource management while generating relevant data for decision makers on both sides of the border.

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### 575 3:00 pm 33

#### The Association Between Acculturation, Screen Media Use, and Body Appreciation among Latina Preadolescents

**Athena Cisneroz, Masters of Arts in Psychology (M)**

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

#### Background/Purpose:

Body appreciation, defined as favorable opinions, respect, and acceptance toward one's body, is associated with positive health and well-being outcomes. Research shows that exposure to Western media is associated with greater internalization of the thin body ideal and body image dissatisfaction. While Latina young adults living in the U.S. report levels of body dissatisfaction comparable to or higher than their European-American counterparts, research on body image development among Latina youth is limited. Relative to body image across the lifespan, the greatest drop in women's body image occurs between the ages of 10-14 years old. The current mixed-methods study aims to address a research gap by examining associations between levels of acculturation, screen media use, and body appreciation among Latina preadolescents.

#### Method:

The current sample includes preliminary data from 20 Latina preadolescents ages 8-11 years who reside in San Diego County and were recruited as part of a larger pilot study. Participants completed surveys measuring levels of acculturation across subdomains of language use, media, and ethnic social relations using the Short Acculturation Scale for Hispanic Youth (SASH-Y); screen media use across social media, internet, gaming, and TV screen types; and body appreciation using the Body Appreciation Scale-2 (BAS-2). Bivariate correlations are planned to examine associations between levels of acculturation, screen media use, and body appreciation. Data from semi-structured interviews covering topics relating to screen media use, maternal communication and peer influences, and body appreciation will be analyzed using rapid qualitative analysis.

#### Expected Results/Implications:

A significant association between levels of acculturation, screen media use, and body appreciation is predicted based on the Tripartite influence model of body image. Specifically, higher total acculturation and screen media use will be associated with lower body appreciation, with the strongest associations observed between the media acculturation subdomain and social media screen type with body appreciation. Findings may improve understanding of the sociocultural influences affecting body appreciation among Latina preadolescents to inform culturally tailored interventions targeting positive body image promotion.

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**576 3:00 pm 34**

### A Drosophila Genetic Screening Platform to Identify Conserved Factors that Influence Biological Outcomes Following Traumatic Brain Injury Exposure

**Jesse Rojas, Masters of Science in Cell and Molecular Biology (M)**

Following traumatic brain injury (TBI) exposure a wide range of factors including genetic have the potential to influence the biological outcomes. Millions of people worldwide sustain a wide range of head trauma, resulting in diverse outcomes. The

potential for genetic factors to influence TBI outcomes requires further studies. Here we use a high throughput Drosophila screening platform to elucidate key genes and pathways that may influence TBI outcomes. This included the use our BeadRuptor trauma technology and validated TBI phenotypes, along with the Drosophila Gal4-UAS system to modulate select genes in adult fly neural tissues. RNAi knockdown (KD) technique was used to target autophagy (ref(2)P), lipolytic (lipase3), glycogenic (GlySyn), and inflammatory (crq) pathway components. Adult cohorts were exposed to severe (sTBI, 1x) or mild repetitive trauma (mTBI, 10x) conditions to assess individual genetic changes to TBI outcomes. Biological assessments included modified longevity profiles, behavioral changes (negative geotaxis response, NGR), alterations to protein turnover (autophagy), and inflammatory profiles. Mortality indexes (MI24hr) and aging studies show genotypic dependent changes, reflecting both sensitivity and resistance to following trauma exposure when compared to wildtype (WT) controls. Alterations to climbing behaviors (NGR) also showed similar genotype dependent responses following mTBI (10x). Neural Western analysis established basal and fasting induced alteration to autophagic responses. Further, each RNAi KD showed genotype dependent impact on NF- $\kappa$ B signaling targets (AMP). This included basal inflammatory profiles as well as following primary (4hr post mTBI) and secondary (24hr post mTBI) injury responses. In summary, there was a genotypic specific concordance between longevity and locomotor profiles following trauma, along with unique proteolytic, and neuroinflammatory responses highlighting potential key molecular mechanisms. This work demonstrates the versatility of a Drosophila as a genetic screening platform to examine neural responses and outcomes following trauma. Genes examined here have human homologues and known genetic variants, highlighting potential targets for further investigation of trauma patients.

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**577 3:00 pm 35**

### Mindfulness and Well-being in Asian Americans and Parents

**Sooji Kim, Child Development (M)**

Research indicates that Asian American parents tend to have high academic expectations for their children, and that these expectations in combination with parent-child conflict can have a negative impact on child wellbeing. However, little research has addressed the mental health and wellbeing of Asian American parents, which is likely associated with parent-child relationships and child mental health. Mindfulness has been associated with mental health and positive relationship outcomes in the literature. The current study examines the potential beneficial role of mindfulness in Asian American families by examining associations between mindfulness and wellbeing in Asian Americans, parents, and Asian American parents. Secondary data analysis of previously collected anonymous questionnaire data. Measures include: demographics, trait mindfulness, mindfulness practices, self-compassion, and mental health. Pearson's correlations were conducted to ascertain associations between mindfulness and wellbeing in Asian Americans, parents, and in a smaller

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sub-sample of Asian American parents. Results have implications for elucidating understanding in the field regarding mental health in Asian American parents, and associations between mindfulness and wellbeing in this population that may have implications for mindfulness practices helping Asian American families.

**578 3:00 pm 36****Population Distance in Lower Rio Verde, Oaxaca****Abilene Ayala, Master of Arts in Anthropology (M)**

This research examines the interaction between past societies and their surroundings during external adversity. Oaxaca's lower Rio Verde Valley region experienced a population shift around ca. 800 CE (Joyce 2008; Joyce et al. 2001, 2014). Extensive transdisciplinary research in the coastal lowlands suggest that anthropogenic and climate change played a pivotal role in the demographic transition. There have been joint efforts integrating archaeological, bioarcheological, geomorphological, and environmental studies to uncover the cause for the change in habitation patterns. A current international transdisciplinary project is working to unravel the role of socio-environmental factors on the landscape (Mayes & Joyce 2020). As seen in the past and present, migration has been a coping mechanism to withstand hardships such as anthropogenic and landscape change. Population movement can be exposed through a biological distance analysis. Drawing on dental data, biological distance can be measured temporally, and spatially within or across sites. While DNA has yet to be retrieved due to the condition of the skeletal remains, dental morphology which is highly genetically controlled offers valuable insights. Dental non-metric traits are scored and statistically measured to determine biological distance. This study has the potential to reconstruct kin and settlement patterns during a time of hardship through dental traits.

**Session I-6**

Biological and Agricultural Sciences

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

**579 3:00 pm 37****Coordination of the NF-kB and Notch signaling pathways in supporting ovarian cancer relapse****Gregory Jordan, Cell and Molecular Biology/Doctor of Philosophy (D)**

Ovarian cancer is the most lethal gynecological malignancy in the United States and the fifth most lethal cancer in U.S. women. Although patients typically respond well to initial chemotherapy treatments, around 80% of women will relapse with chemotherapy resistant disease. Studies have identified a subpopulation of ovarian cancer cells, termed cancer stem-like cells (CSCs) that, unlike bulk cancer cells, possess the ability to resist chemotherapy and repopulate the tumor. Previous work has shown that the CSC phenotype is supported by

alternative NF-kB signaling, and the effects of this pathway on the CSC phenotype can be modulated by chemotherapy. Additionally, it has been shown that the alternative NF-kB pathway cooperates with the Notch signaling pathway, a crucial developmental pathway important in ovarian CSCs. What remains to be discovered is the mechanism by which these pathways interact to modulate CSC self-renewal, proliferation, and drug resistance. We hypothesize that the alternative NF-kB transcription factor RelB maintains CSCs following chemotherapy through subsequent upregulation of Notch receptors and ligands. To test this hypothesis, ovarian cancer cell lines were subjected to multiple rounds of carboplatin chemotherapy and analyzed via qRT-PCR for alternative NF-kB gene expression and Notch gene expression. Increased gene expression of genes encoding for Notch ligands and alternative NF-kB proteins were shown in cells that survived chemotherapy. Additionally, ovarian cancer cells modified to be unable to express RelB were grown as regular 2D monolayers or 3D CSC promoting conditions. Subsequent RNA sequencing of these cells showed reduced Notch ligand expression in CSCs when RelB was absent. Finally, the cytokine TWEAK was used to stimulate alternative NF-kB expression in ovarian cancer cell lines that had been prior sorted for CSCs. An increase in Notch ligand expression was seen in CSCs stimulated with TWEAK vs vehicle. All of this data suggests that the alternative NF-kB pathway upregulates the Notch signaling pathway in CSCs post-chemotherapy. This work highlights the importance of deciphering the mechanisms of this signaling axis, as it may be used to guide the design of more effective therapeutic combinations that may ultimately reduce CSC phenotypes and increase survival for ovarian cancer patients.

**580 3:00 pm 38****Drug transporter knockout and gut microbiome analysis in *Lytechinus pictus*: Building a model for commensal interactions and disease mechanisms****Lauren Stoeltje, Cell and Molecular Biology (M)**

Increasingly recognized as a global health challenge, Inflammatory Bowel Disease (IBD), which includes Crohn's disease and ulcerative colitis, remains enigmatic in its underlying causes. Recent insights point to dysregulated immune responses against the intestinal microbiota in genetically susceptible individuals. The transporter ABCB1 (known as P-glycoprotein) has emerged as a pivotal player for proper immune modulation and maintenance of microbial balance in the gut. However, the exact mechanisms leading to heightened IBD pathogenesis in the absence of strong ABCB1 activity remain unclear, and are difficult to quickly test and validate in mammalian models.

Utilizing an established ABCB1 knockout sea urchin line (*Lytechinus pictus*), we seek to build a model for testing the function of ABCB1 in the context of commensal maintenance. Imaging of early gastrula and larval stages revealed inflammation within the gut epithelia of ABCB1-KO larva, resembling an IBD phenotype. Ongoing 16S amplicon Next-Generation Sequencing across various larval stages up to metamorphosis will be used to assess differences in the relative

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abundance and composition of commensal communities between wild-type and ABCB1 knockout larvae.

These findings underscore the conserved role of the ABCB1 transporter in gut health regulation and its interplay with the gut microbiota. Our ongoing comprehensive analysis of gut microbiota dynamics will provide a deeper understanding of these intricate interactions. Further exploration of these mechanisms could offer novel insights into IBD pathogenesis, potentially paving the way for innovative therapeutic strategies.

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### 581 3:00 pm 39

#### Preserver of Reproductive Integrity: ABC transporters and their role protecting the germline Timothaus Haddad, Masters of Biological Science (M)

Cellular defense systems are fundamental to life and dictate survival in an increasingly polluted world. Organisms are continuously exposed to xenobiotics (naturally occurring toxins or anthropogenic compounds) that persist in their environment. I seek to identify the threshold of xenobiotic protection available in mammalian primordial germ cells (PGCs): the embryonic stem cells to eggs and sperm. Most animals and model organisms “set aside” PGCs early in the embryo and maintain it until the adult stage of gamete development is reached. However, little is known about the protective toolkit of PGCs at the plasma membrane. This is important to understand because early-life encounters with xenobiotics could negatively impact reproductive potential of the adult. Ubiquitous environmental chemicals commonly found in human blood include plasticizers, polyaromatic hydrocarbons, and perfluorochemicals. Pivotal to the front lines of cellular defenses are transporters of the ATP-binding cassette superfamily. ABC transporters’ primary conserved function is to export xenobiotics and small molecules out of the cell. Using an in-vitro derivation protocol, I am testing which ABC transporters are present in and most utilized by human PGCs. This will improve our understanding of how organisms protect their reproductive capability at the earliest developmental stage possible. Using immunolocalization and cell sorting techniques with transporter-specific antibodies, I have identified that ABCC1 and ABCG2 are enriched in hPGCs. This is the first description of these proteins in this cell type. To knockout ABCC1 in these cells, I will design and deliver sgRNA guides against ABCC1 alongside Cas9 and GFP-reporter constructs in our hESC lines (UCLA1 [46XX] and UCLA2 [46XY]), via transfection and selection protocols that have proven successful in these cells. I will then test how sensitive ABCC1-knockout PGCs are to known cord blood contaminants. This proposed work provides an exciting opportunity to elucidate the role of ABCC1/ABCG2 in the development and/or protection of human PGCs against toxicants that pose a known threat to reproductive function. Therefore, the potential findings of this study can inform researchers studying germ lines in other organisms and broaden the community’s understanding of how animals can maintain reproductive output in light of xenobiotic exposures.

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### 582 3:00 pm 40

#### Environmental Impacts of Emerging Tobacco Products as Litters

##### Ashley Chang, Masters of Science in Public Health with a concentration in Environmental Health (M)

Electronic nicotine delivery devices (ENDS), commonly known as e-cigarettes, are widely used throughout the United States. Previous research has determined ENDS and heated tobacco products (HTP) to be improperly disposed of in the environment, such as in waters or on the ground, as tobacco product waste (TPW). However, little is known about the long-term health and environmental effects of ENDS and HTPs despite their growing market. Other studies have shown cigarette butts to release highly toxic chemicals in the environment, which impact wildlife and humans alike. Consequently, this research focuses on studying newer HTPs from Asia that will soon be sold in the United States utilizing quantitative analysis of nicotine and cotinine, major chemical components of tobacco products, and qualitative analysis of other chemicals in the leachates of the products. Leachate samples mimic the way the products exist once discarded in the environment, particularly in water. Comparative analyses of popular ENDS, HTPs, and cigarette butts are crucial to evaluate the relative hazards of these popular devices as they are routinely smoked, improperly discarded as TPW, and repurchased. Findings will aid in the toxicity assessment of HTPs and ENDS which will be shared with outside organizations and agencies to assist with regulations and minimize consumption for at-risk youth.

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### 583 3:00 pm 41

#### Interactions Between Bacteriophages and Phagocytes

##### Allison Hedin, Masters of Sciences in Cellular and Molecular Biology (M)

Antibiotic resistance is a global problem that has made treating bacterial infections more problematic and deadly for patients over time. Therefore, using bacteriophages, viruses that infect and kill bacteria, is becoming more enticing as a secondary form of antimicrobial therapy. However, phages are viruses, and when used in a form of therapy it could be potentially triggering the patient's immune system. In our research we focus on the phages impact on the innate immune system, the bodies first line of defense against infections. In order to study the innate immune system, we use dendritic cells and macrophages, both cell types with important viral receptors that help induce an antiviral state. Treating dendritic cells and macrophages with phage and using qPCR as well as RNA seq, we can analyze the gene expression induced by the presence of phages over time. Numerous genes were seen to be either up or downregulated, but overall, gene expression was upregulated for genes that code for cytokines such as IFN beta, ISG 15, IL 6 and TNF alpha. These are all important proteins that can help induce an antiviral state in the immune system. Therefore we can deduce that the use of bacteriophages as a form of therapy will also activate an antiviral state by the immune system in the patient.

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**584 3:00 pm 42****Determining the resistance of coast live oak (*Quercus agrifolia*) dominated forests in San Diego County to outbreaks of *Phytophthora* pathogens****Fortunato Rivas, Masters of Science in Biology, Ecology Concentration (M)**

Coast live oak (*Quercus agrifolia*) serves as a keystone species in California, supporting thousands of fauna with biological resources (e.g., food and shelter) and indirect benefits to cohabiting plant species through their interactions with soil communities. These trees provide crucial environmental services to their ecosystems like carbon sequestration, erosion control, and the promotion of groundwater infiltration. Coast live oaks occur throughout much of San Diego County, where they comprise sensitive habitat, especially in protected habitat preserves set aside in response to human development. Unfortunately, these vital trees are vulnerable to numerous human-introduced biological threats that are reducing oak woodlands throughout the state. Infection by soil pathogens like *Phytophthora* is just one example of an exotic pest that land managers are monitoring for and combating. Signs and symptoms of the various ecological threats are not always apparent, as is the case in a preserve that I manage in Escondido where several mature and sapling oaks have died in just a few years. Concerns with recruitment have also arisen, as darkened, mushy acorns have been observed in the preserve and parts of the county. Goals: This study seeks to 1) identify the pathogen attacking the acorns, 2) to determine whether this is the cause of this mortality, and 3) to identify individuals that are resistant to this pathogen for restoration. Methods: In order to achieve objective 1, I have collected infested acorns from the site and performed DNA extraction and PCR using specific primers to target conserved regions (ITS1-ITS4). This region will be sequenced and matched against a library for pathogen identification at the genetic level. For objective 2, I will be germinating acorns with inoculum from soil and acorn samples that were collected within the preserve in areas of mortality and healthy reference sites. In order to achieve goal 3, I will determine if resistance genes are present in individuals grown in the inoculum. Preliminary results: The ultimate goal of this research is to help land managers prepare for and prevent impacts from a potential new threat. Ensuring the health of oak woodlands is key to the health of our ecosystems.

**585 3:00 pm 43****The role of ChrY in human microglia and neurodevelopment****Jessica Esparza, Masters of Microbiology (M)**

In 2023, the prevalence of autism spectrum disorder (ASD) in children was 1 in 36. When it comes to the genetic factors contributing to ASD, progressive Y chromosome (ChrY) aneuploidy is associated with a higher risk compared to X aneuploidies. Boys are nearly four times more likely to be diagnosed with ASD than girls, but there has been limited research on the sex-related aspects influencing autism. Research conducted on individuals with autism has shown

unusual characteristics in microglia. Abnormalities in microglia have been linked to irregular synaptic pruning, disruptions in the development of cortical layers, and elevated levels of neural progenitors, a connection to ASD. To explore the influence of genetic sex factors on microglia function, we developed a model system to examine the impact of ChrY in human microglia in relation to its dosage. We reprogrammed lymphoblastoid B-cell lines (LCLs) derived from human donors who possessed between one and four copies of ChrY into human induced pluripotent stem cells (hiPSCs). As expected, we found that elevated ChrY dosage leads to heightened expression of ChrY-associated genes in human microglia. Through xenotransplantation of euploid and aneuploid microglia, we found that microglia containing extra copies of ChrY display heightened pro-inflammatory characteristics in vivo, such as increased pro-inflammatory markers, reduced homeostatic markers and more amoeboid morphology. Interestingly, these changes are associated with pro-inflammatory responses in nearby cell types. These findings reveal that ChrY has the capacity to influence both the gene expression and functionality of human microglia in the brain.

**586 3:00 pm 44****Alzheimer's Disease DNA Barcoding****Sol Diaz, Master of Science in Physiology (M)**

Alzheimer's disease (AD) is a neurodegenerative disorder and is the most common cause of dementia. Despite AD being a common disease, there are still no effective therapies. Recent studies reveal the important role of microglia and neuroinflammation in AD pathology by increasing A $\beta$  production, degradation of the blood-brain barrier, and dysfunction of endothelial cells. Our lab has previously shown that transplantation of healthy hematopoietic stem and progenitor cell (HSPC) not only prevented microglial activation and reduced neuroinflammation but also reduced A $\beta$  plaque storage, which has the potential to prevent AD challenges and become a therapeutic approach. Previous studies have also investigated myeloid cell engraftment in the brain after intracerebroventricular (ICV) injection of HSPCs, assessing their cell fraction contribution to microglia-like cell reconstitution in ICV transplant settings which have contributed to the importance of microglia in AD.

Microglial in the brain come from myeloid precursor cells from HSPCs that migrate to the central nervous system and become differentiated. Once differentiated, microglial regulate inflammation by releasing cytokines, in disease these can be dysregulated leading to chronic inflammation which contributes to neurodegeneration. Recently the importance of microglial and inflammation has been described more and more in the literature. Therefore it is important to understand where these cells come from.

This study aims to examine microglial origin and proliferation using a lentivirus with various viruses containing a unique twelve-base pair sequence or "barcode" that we can use to identify and track microglial from HSPC through the blood into the brain. We aim to uncover if one or several microglia enter and proliferate through the brain. Using this lentivirus, we aim to

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distinguish and track HSPCs and understand their response to different stimuli or contributions to the pathological process. We have transplanted HSPC transduced with our "barcode" into the 5xFAD AD mouse model and wildtype mice to understand the origin or pathway of microglia from HSPCs and their diversity in AD. Since the fields of HSPC transplantation and microglia continue to advance, our potential contributions could increase the understanding of microglial origin and proliferation in the brain, leading to more accurate targeted therapies for AD.

## Session I-7

Health, Nutrition, and Clinical Sciences

Friday, March 1, 2024 3:00 pm

Montezuma Hall

**587 3:00 pm 45**

A Mixed Methods Study on the Need for Gender-Responsive (GR) Drug Services in Tonga

**Mele'ana Akolo, PhD Interdisciplinary Research on Substance Use (D)**

The worldwide increase of drug use, availability, manufacturing, and distribution impacts low-middle-income-countries (LMIC). There have also been increases in drug crises calling for responses that provide drug treatment to those who develop substance use disorder (SUD). However, little is known about drug treatment in LMIC and how well they respond to the needs of those with SUD. More importantly, research is needed on drug treatment in LMIC to be able to advance these services. The Tonga Islands is a LMIC where as of 2022 the United Nations Office on Drugs and Crime (UNODC), reports Methamphetamine is the primary drug of concern and is at the center of the Kingdom's drug crisis. The objective for this research is to develop understanding for drug services in response to the drug crisis in the LMIC Tonga by evaluating the needs of women with SUD. Moreover, it will develop awareness for women's needs to enhance understanding for the relevancy of gender-responsive (GR) drug services in LMIC to potentially advance existing responses in these regions. Our research aims are to 1) develop understanding for gender differences with drug services to identify the needs of women seeking drug services in Tonga through a mixed methods evaluation design, and 2) define cultural factors associated with gender differences and women's needs when seeking drug services. We hypothesize women have specific needs associated with their position culturally as women when seeking drug services, and when left unaddressed effects their recovery. For our study we take multiple approaches with research design. In addition to utilizing a mixed methods evaluation design, we employ autoethnographic methods where the researcher identifies with the community under study. The Principal Investigator is a Tongan-American woman, working as an SUD counselor in the US at women-only drug treatment facilities, and will lead the research with a subjective position. This approach will guide data collection and analyses to give adequate consideration for cultural schema with gender in Tonga. This is to address

the issue with lack of understanding for cultural diversity with drug crises and responses with drug services globally in South Pacific Region LMIC.

**588 3:00 pm 46**

Assessing the role of social support as a buffer against bias-based bullying and depressive symptoms among Latinx adolescents

**Alana Lopez, JDP in Public Health (D)**

Latinx adolescents experience increased risk of depressive symptoms compared to other racial/ethnic groups. Experiences of biased-based bullying—bullying based on identity such as race, ethnicity, gender, or national origin—may play a role in this disparity. Social support may mitigate the negative effects of bias-based bullying on Latinx adolescents' mental health. We examined the association between bias-based bullying and depressive symptoms among Latinx adolescents, and assessed whether social support from families, peers, and adults at school moderate this relationship. Using data from the 2019-2020 statewide California Healthy Kids Survey (CHKS; n=38,151 adolescents in grades 6-12), were analyzed the associations between two types of bias based bullying: (1) bullying due to race/ethnicity/national origin, (2) bullying due to immigration status (real or perceived), with adolescents' self-reported past-year depressive symptoms. We used Interaction terms to examine the role of social support (family, peers, and adults at school) in moderating this relationship. Findings showed that Latinx students who experienced past-year bullying due to race/ethnicity/national origin and immigration status (real or perceived) had increased risk of depressive symptoms. Compared to Latinx adolescents who did not experience bias-based bullying, those reporting one past-year experience of bias-based bullying evidenced more than two times greater odds of depressive symptoms (AORs: 2.40-2.63, p-values <0.001) and those reporting two or more experiences of bias-based bullying evidenced nearly four times greater odds of depressive symptoms (AORs: 3.68-3.87, p-values < 0.001) Social support from peers and family significantly moderated the relationship between both types of bias-based bullying and depressive symptoms. Our findings also showed that peer and family social support interacted with each other. Specifically, adolescents with the highest levels of peer support, yet low levels of familial support, had the highest risk of reporting depressive symptoms. Findings have implications for the revision of school policies to more acutely target bias-based bullying as a potential lever to decrease mental health disparities in this population. In addition, these findings highlight the critical role of family support in buffering against the negative effects of bullying for Latinx adolescents.

**589 3:00 pm 47**

The influence of the microbiome on metabolic changes in Chagas disease

**Luis Ernst, Chemistry - Biochemistry (D)**

Chagas disease (CD) is emerging as one of the most concerning parasitic diseases in the New World. CD is a neglected tropical

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disease caused by the protozoan *Trypanosoma cruzi* (*T. cruzi*), which can be differentiated into an acute and chronic phase. The acute phase is often asymptomatic, while 30-40 % of the patients develop a chronic disease in which they suffer from cardiac, digestive, or cardiodigestive health issues. An estimated number of 6 million people worldwide were infected and at least 300,000 infected people live in the United States of America. Benznidazole and nifurtimox are the only two drugs currently available for treating the acute phase. Resistance mechanisms, drug safety concerns, and missing medicine to treat the chronic stage of the disease show the importance of contributing to a better understanding of the infection, to make drugs more efficient and safer. In a recent publication, it was shown that the inability to restore metabolic changes that were caused by *T. cruzi* may contribute to the low efficacy of benznidazole for treating chronic symptomatic CD. It was also observed that microbial alterations may affect the host inflammatory responses and may play an important role in parasit survival in the host organism. This project uses mass spectrometry-based metabolomics and three-dimensional modeling of different organs in a mouse model to expand the understanding of the microbiome's role during *T. cruzi* infection. The results show an altered concentration of acylcarnitines in the gastrointestinal tract dependent on the presence or absence of a microbiome. In other words, the microbiome supports the restoration of some metabolic features in certain organs, while it does not in others. Therefore, metabolic changes are correlated with changes in the microbiome initiated by the infection. Understanding these changes could be the key to developing medicine to improve the lives of people suffering from Chagas disease.

### 590 3:00 pm 48

A review of registered breast cancer clinical trials and mortality using the Surveillance, Epidemiology, and End Results (SEER) program from 2006-2020

**Kevin Nugent, Masters of Science in Epidemiology (M)**

**Background** Breast cancer (BC) mortality in the United States (US) has improved since the 1990s due to advancements in treatments. The types of BC drugs entering phase I/II trials from 2006-2020 have evolved but have not been systematically evaluated.

**Objective** To examine the phase I/II clinical trial landscape with emphasis on therapeutic modalities and BC mortality by race and BC subtype.

**Methods** We queried ClinicalTrials.gov for completed phase I/II trials of interventional therapy for women with BC from 2006-2010, 2011-2015, and 2016-2020. Trials were assessed for race/ethnicity (Hispanic; non-Hispanic white, NHW; African American, AA; Asian; American Indian/Alaska Native, AIAN; Native Hawaiian/Pacific Islander, NHPI), drug modalities (chemotherapy, hormone therapy, targeted therapy, immunotherapy), and BC subtype [HER2+; HER2-; ER+ or PR+, ER- and PR-, HER2-/ER-/PR- (triple negative BC (TNBC))]. We used the SEER Program to describe mortality rates among 622,490 women diagnosed with BC from 2011-2020. Multinomial logistic regression was used to estimate odds ratios

(ORs) and 95% confidence intervals (CIs) for the associations between race/ethnicity and BC subtype and Cox proportional hazards regression was used to estimate hazard ratios (HRs) and 95% CIs for the associations between race/ethnicity and BC mortality.

**Results** In 130 phase I/II trials, most women (75.9-81.6%) were NHW, followed by Hispanic (7.5-16.6%), AA (6.6-12.0%), Asian (2.9-8.6%), AIAN (0.1-1.9%), and NHPI (<1%). Most trials (>78%) used targeted drugs or chemotherapy. Targeted drugs declined from 60.5% in 2006-2010 to 45.9% in 2016-2020; however, among TNBC-focused trials, targeted monotherapy drugs increased from 16.7% in 2006-2010 to 100% in 2016-2020. TNBC-focused clinical trials increased from 3.6% to 32.4%, while non TNBC trials decreased from 96.4% to 67.6%. In SEER, most women were NHW (66.8%), followed by Hispanic (12.6%), AA (10.6%), Non-Hispanic Asian/Pacific Islander (NHAPI, 9.4%), and AIAN (0.6%). AA women had a two-fold increase in the age-adjusted odds of TNBC (OR=2.52; 95%CI=2.56-2.58) and a 39% increase in the age-adjusted rate of mortality (HR=1.39; 95% CI=1.33-1.44) compared to NHW women.

**Conclusions** Phase I/II clinical trials to address TNBC have increased since 2006, as have targeted monotherapy drugs. TNBC, however, continues to be a lethal BC subtype particularly among AA women.

### 591 3:00 pm 49

Evening Chronotypes are at Higher Risk of High Sugar Consumption due to Greater Sweet Taste Preference

**Katie Williams, Masters in Nutritional Sciences (M)**

**Background:** Evening chronotypes (EC), a sleep phenotype marked by late bedtime and activity, are at increased risk of excessive weight gain. These gains are partly attributed to high intake of added sugar and low intake of fruit/vegetables. Existing literature suggests that high intake of sugar is driven by greater preference for sweet taste, yet this relationship has never been explored in sleep chronotypes. We hypothesize that a tendency towards EC will increase preference for sweet taste, which will result in higher sweet liking, increased sugar intake, and lower fruit/vegetable intake. **Methods:** Fasting participants (n=23) completed a sweet preference task using 5 sucrose solutions in the Monell forced-choice procedure and rated the liking of each solution. A 20-minute ad-libitum snack tasting of savory and sweet foods was conducted and intakes were recorded. Chronotype was assessed using the Morningness-Eveningness Questionnaire (MEQ; score <41: Evening Chronotype (EC), >59: Morning Chronotype (MC)). Skin carotenoid concentrations were determined using VeggieMeter, with higher scores indicating greater fruit/vegetable intake. **Results:** Of the 23 participants (age 24.9±6.4), 78% were female and 60% had a healthy BMI (23.9±3.7 kg/m<sup>2</sup>). Five participants were MC, 13 were Intermediate Chronotype (IC), and 5 were EC. Independent of chronotype, greater sweet taste preference was positively correlated with liking of sweetest solutions (r=0.71, p<0.001), and with sugar consumed in snacks (r=0.30, p=0.08). EC preferred sweeter sucrose solutions (P=0.09; 3.8 ±

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0.7), compared to IC (2.5±1.17) and MC (2.9±1.38). However, liking of sweet solutions did not differ between chronotypes. Though not significant, low MEQ scores correlated with higher intake of calorie-dense snacks ( $r=-0.22$ ) and higher % of snack calories consumed as sugar ( $r=-0.14$ ). VeggieMeter scores were lowest in EC (320.6±77.7), compared to IC (354.6±93.6) and MC (374.6±98.2), suggesting lower fruit/vegetable intake in EC. Conclusion: Our preliminary findings suggest that EC are at higher risk of consuming sugary foods due to high sweet taste preference, putting them at greater risk for obesity.

**592 3:00 pm 50****Effects of Postnatal Choline Supplementation on Lipid Profiles and Liver Function Markers in Alcohol-Exposed Sprague Dawley Rats****Meghen Bishop, Masters in Nutritional Sciences (M)**

Fetal alcohol exposure can profoundly affect physiological development, leading to a range of physical and behavioral disruptions known as fetal alcohol spectrum disorders (FASD). Choline, an essential nutrient crucial for CNS function, is being examined as a potential treatment for FASD, given its protective role in a complex network of pathways essential for overall physiological processes. Choline has shown efficacy in reducing behavioral effects associated with prenatal alcohol, its effects on health remain unknown. This study investigates the impact of choline supplementation on Sprague Dawley rats using an FASD animal model, assessing physiological development through serum lipid profiles, liver function markers, body weight and liver weight. This study used 2 (Ethanol, Sham) x 2 (Choline, Saline) x 2 (Male, Female) design. Ethanol-exposed rat pups received 5.25g/kg/day ethanol via gastric intubations during early postnatal development (PD 4-9), equivalent to late gestation in humans. Subjects were treated with choline chloride (100 mg/kg/day) or saline solution from PD 10-30. Subjects were euthanized on PD 36, with blood samples and liver tissue collected. Results revealed that males exhibited significant weight gain with greater final body weight and liver weight compared to females ( $P<0.001$ ). Developmental ethanol exposure reduced weight gain ( $P=0.039$ ) compared to the sham control group. Concerning lipid profiles, females exhibited a higher trend in HDL levels ( $P=0.070$ ) compared to males. There was a trend toward a sex and choline interaction on LDL, as choline treatment reduced LDL in males ( $P=0.076$ ). Alkaline phosphatase (ALP) levels were higher in males than females ( $P=0.007$ ), and lactate dehydrogenase (LDH) levels exhibited a trend toward a sex and choline interaction, with lower LDH in choline-treated males but higher in females ( $P=0.081$ ). These findings highlight the complex relationship between fetal alcohol exposure, choline supplementation, and physiological outcomes, particularly in the context of weight gain, lipid profiles, and enzyme levels. Further research is necessary to clarify findings related to trends in choline supplementation effects on liver function. Understanding the effects of choline on physiological outcomes is critical for elucidating mechanisms and potential therapeutic implications of choline supplementation in mitigating the detrimental effects of fetal alcohol exposure on physiological development.

**593 3:00 pm 51****Empowering Women's Well being: A Comprehensive Approach to Social Health Disparities****Maria Fernanda Carrillo Escarcega, Master of Science in Big Data Analytics (M)**

Abstract: This project explores deeply the complex relationship between social health status and the well-being of vulnerable women, applying a comprehensive methodology that smoothly integrates Geographic Information Systems (GIS), surveys, and ethical frameworks derived from Pope Francis' encyclicals. Utilizing data from Global Digital Impact, an advocate for sustainable and socially responsible practices, this project's goal is to deliver vital information to women facing harsh vulnerabilities in Latin American countries (Mexico, Colombia, and Venezuela) and the United States. By harnessing the potential of GIS mapping, our approach goes beyond visualization, it involves precise analysis of spatial patterns of social health disparities, focusing specifically on the demographic of vulnerable women. Our distinct strategy not only allows us to explore existing disparities but also aids in bringing a targeted and responsive intervention in areas where these inequalities are happening the most. As we navigate these challenges, this project greatly contributes to the framework of Cooperative Humanitarian Integrated Action for reduce Digital Apartheid (CHIARA) with the vision and concepts of the Economy of Francesco, hoping to create a positive impact that resonates within the realms of both research and real-world application.

**594 3:00 pm 52****Exploring Secondhand Exposure to Vaping: A Dyad Study Using Wristband Nicotine and Urinary Cotinine****Samantha Suess, Masters of Public Health in Epidemiology (M)**

Background:

The continuous rise in vaping particularly among young adults has become evident, however little is known about the exposures and health effects of secondhand exposure from vaping. Silicone wristbands can be used as a tool to capture and easily measure toxins, like nicotine. While wristbands are a feasible method for capturing nicotine, their use in the field of research is still novel as it is under-utilized.

Methods:

The Dyad Vaping Study was a pilot study that recruited vaper and non-vaper participants. A total of 6 dyads (12 participants) were enrolled. Each dyad consisted of a vaper and non-vaper who spent ample time together. Participants were sampled for 3 consecutive months. Eligible participants were asked questions, and given silicone wristbands to capture nicotine exposure. Seven days later, wristbands, surveys, and urine samples (for cotinine analysis, a metabolite of nicotine) were collected from each individual.

Results:

Nicotine was detected in all wristbands, with an overall

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geometric mean level of 9.7 ng/wb in vapers and 7.25 ng/wb in secondhand vape exposed. The percent difference between the vapers and secondhand vape exposed in each dyad had an overall median of 32.02%, with an interquartile range (IQR) of 34.77% among nicotine levels. Vapers had an overall geometric mean of 9.70 ng/ml, and 2.59 ng/ml among secondhand exposed in cotinine levels. Among cotinine percent differences in vapers and secondhand vape exposed in each dyad, the median was 112.95% with an IQR of 20.32%. Between the urine and wristband levels, vapers had higher overall levels and secondhand exposure had lower levels overall. Furthermore, urine and wristband measurements were positively correlated ( $\rho=0.62$ ,  $p$ -value = 0.0005).

Conclusion:

This research provides preliminary insight on trends and positive correlations among the nicotine from silicone wristband and urinary cotinine of young adults. With higher geometric means among the vapers, and large IQRs, it is evident the trends are similar between both nicotine and cotinine data. Future research should utilize the silicone wristband, a novel research method, to further understand the impact of vaping on non-vapers.

## Session I-8

Education

Friday, March 1, 2024 3:00 pm

Montezuma Hall

### 595 3:00 pm 53

A Case Study: Comparing Instruments in Chemistry Education and Mathematics Education with Coding Scheme

**Ruo Ning Qiu, Ph.D. in Mathematics and Science Education (D)**

This poster showcases a coding scheme designed to extract information about instruments (e.g., surveys, questionnaires, etc.) used in chemistry education literature and how the coding scheme applies to a case study in mathematics education literature. The original coding scheme is employed in the CHEMistry Instrument Review and Assessment Library (CHIRAL) project. Coded instruments, panel-reviewed by experts to aid consumers in making data-informed decisions, are available in the database (at [chiral.chemedx.org](http://chiral.chemedx.org)) for other researchers to search and reuse, thereby promoting sustainability within the field. By comparing the coding process applied to an instrument in another discipline (mathematics, in this case), this study verifies the applicability and transferability of the coding scheme originally designed for chemistry instruments. This case study also initializes forming a robust framework for coding instruments to summarize their characteristics like validity, reliability, and demographics in education journals of other disciplines, as an extendable direction of the CHIRAL project.

### 597 3:00 pm 55

Inclusive English Language Development Practices in the Classrooms for English Language Learners at the Imperial Valley Borderlands

**Isua Camarena, Teaching Credential (M)**

Growing up in the Imperial Valley-Mexicali borderlands I could not picture myself graduating from a university or attending graduate school. My parents were able to support me up to a certain point because of their language barrier. Growing up, one of the challenges I struggled with was the language barrier; they only spoke Spanish and so did I. Flash-forward fifteen years and there I was facing one of the most important pivotal moments of my life. Living near the borderlands has given me the opportunity to interact with adults and students from different backgrounds. I have worked with students who are bilingual and also those who are learning the English language. This study is focused on my lived experiences as both a student and educator at the Imperial Valley borderlands.

In this photovoice autoethnography I dive into the many challenges ELL students face and the ways we, as educators can assist students in their educational journey at the Imperial Valley borderlands. We can accomplish this by using the proper inclusive strategies and by being aware of the different stages of their development. Through their development, ELL students will face many challenges that may slow their learning progress. I further discuss the practices educators can take to create a positive environment which will help students to grow. Considering the different forms of capital English learners bring into the classroom is fundamental to helping create the best inclusive lessons to help students achieve a successful English learning experience.

This study is guided by the Cultural Wealth Model framework by Yosso (2015) and the Culturally Relevant Content Elements by Pang (2018). Creating an inclusive education setting for English language learners is primal in their development. Some challenges that many ELL students face come from outside sources. Every student should feel welcome and feel a sense of belonging. Some of the challenges of this population of students can be lessened by applying inclusive practices into my classroom.

### 598 3:00 pm 56

My Building Bridges Graduation Experience: A Photovoice Autoethnography Exploring the Right to Celebrate Graduation at the Imperial Valley-Mexicali Borderlands

**Andrea Van Bebber, Master in social work (M)**

I am an immigrant and transborder woman. I came from a low-income family living on the outskirts of Mexicali. Even though I lived my whole life so close to the border, the U.S. did not feel like part of my identity. Moving with my husband to the U.S. at the age of 26 was one of the most difficult challenges of my life. I left the comforts of my native country to confront language barriers and cultural differences in an unfamiliar land. I started my education in the U.S. in an ESL adult

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education program, and then I entered a community college and transferred to San Diego State University- Imperial Valley (SDSU-IV). In spite of the challenges, I graduated with honors and obtained my bachelor's in psychology. I am currently working on my master's in social work, and I am a graduate assistant for the Cross-Cultural Center at SDSU-IV. Now the border has a different meaning for me, it is the barrier that separates me from my family, while at the same time, it is the catalyst for my personal growth.

I am also a Transborder Scholar at the Transborder Scholar Collaborative at SDSU-IV, learning about photovoice autoethnography research with assistant professor Dr. Falcón. I will be presenting the recurring themes found in the photovoice autoethnography study about my experiences as a student representative in the 2nd Annual Building Bridges Graduation held in Mexicali. My unique experience as a transborder student has raised the importance of celebrating with our loved ones, language accessibility, and the rights of transborder students to be recognized and celebrated.

This photovoice autoethnography is part of a more extensive study dedicated to exploring the lived experience of transborder students and their engagement in the Building Bridges Graduation. In this study, we will provide recommendations for campus leaders on the significance and importance of implementing an initiative like Building Bridges and what that means for me as a Building Bridges graduate. We will conclude by providing recommendations for policy and practice focusing on sustainability and the future of this initiative for years to come.

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### 599 3:00 pm 57

#### A Personalized Chatbot for Addressing Child Malnutrition

**Surbhi Sawant, Big Data Analytics (M)**

NutriBot is a groundbreaking chatbot designed to combat child malnutrition in diverse communities. By allowing caregivers and NGOs to input a child's age, weight, height, and location, the platform delivers personalized nutritional guidance. Utilizing machine learning algorithms, NutriBot refines its recommendations based on user feedback, ensuring continuous improvement.

The chatbot goes beyond just suggestions, integrating educational content and accommodating cultural nuances, dietary preferences, and restrictions. Collaborations with local experts contribute to the accuracy and relevance of information. To enhance usability and accessibility, NutriBot features an intuitive interface, making it easy for users to interact with the platform. Moreover, the chatbot offers offline access, addressing potential connectivity challenges in certain communities. This ensures that caregivers can access crucial information even in resource-constrained environments.

NutriBot aims to empower caregivers with the knowledge and tools needed to make informed decisions, fostering a more effective and sustainable approach to addressing child malnutrition.

## Session I-9

Business, Economics, and Public Administration  
**Friday, March 1, 2024 3:00 pm**  
 Montezuma Hall

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### 600 3:00 pm 58

#### Commuter Mapping Research

**Natalia Rosales, Undergraduate (SD) Political Science Major  
 Political Science Pre-Major Geological Sciences Major  
 Lesbian, Gay, Bisexual, Transgender, Queer, and Plus Studies  
 Minor (U)**

Under the direction of Dr. Bruce Appleyard of San Diego State University, the Urban Sustainability, Livability, and Equity (SLE) research team, supported by the Faculty Student Mentorship Program (FSMP) conducted a study with individuals who commute to campus. The approach taken to study these dynamics involved conducting cognitive/image mapping exercises with individuals, based on principles set forth by Kevin Lynch's "Image of the City" (Lynch, 1960).

This research uniquely captures the experiences of different individuals. Principally, we were able to learn about how those that use various forms of transportation perceive the environment of their daily lives. Specifically, to conduct our research surveyed individuals to draw maps of their surroundings on their daily routes, which were marked with symbols to identify landmarks. From our review of the maps, we found that those who commute in a car are often less aware of their surroundings.

This work can ultimately help promote a better quality of life for the average person by using the tacit knowledge of their environment in order to improve the real world we live in. Through increased access to transportation services and a greater universal urban landscape, we create better ways to meet the average person's most critical needs, the home territories and lives of all can be improved.

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### 601 3:00 pm 59

#### Why California needs to lower its taxes?

**Ayooab Abed, Bachelors of Science in Finance (U)**

Taxes have become controversial and people question on how much they should be taxed. Many people are leaving to states that have no income tax and is that a good solution? It depends for many, but with my extensive research I have come to find that the answer is "No!" It turns out that the states with no income tax end up taxing on properties, for example, higher than California, the most expensive state. Therefore, what can Californians do to make a living? This comes back to the government and it needs to lower its taxes.

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### 602 3:00 pm 60

#### Houseless Mapping Abstract

**Emily Hernandez Rincon, Psychology w/ Emphasis in  
 Neuroscience (U)**

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This is a study of cognitive/image mapping exercises with houseless individuals, based on principles set forth by Kevin Lynch's "The Image of the City" (Lynch, 1960). Specifically, this study asked houseless individuals to draw maps (on blank pieces of paper) of their surroundings and daily routines, which were marked with symbols to identify important locations. We then had them mark the important locations on printed maps so we could then geo-code this information. Our research found 13 recurring patterns. One of them is that the houseless often travel in regular routes throughout their day. Parks and alleys were marked as places of importance as they offered safe spaces to sleep, congregate and travel through. Waste and recycling bins around campus were a primary location for resource collection. Additionally, we found that people need safe storage, adequate toilet access, & better relationships with police. This work can ultimately help improve the design and planning for shelters and services throughout San Diego county. By establishing better ways to help them meet their most basic needs, through access to services and opportunities, the lives of the houseless can be justly improved.

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**603 3:00 pm 61**

### Binational Planning of The World Design Capital: San Diego-Tijuana

**Gianna Salazar, Bachelors of Arts in Public Administration, Emphasis in City Planning (U)**

The World Design Capital is a year-long program that promotes the advancement of the economic, cultural, social, and environmental development occurring in a designated city. For 2024, the World Design Capital named the San Diego-Tijuana region as the first bi-national location in its history as a result of the area's commitment to creating a legacy of transborder collaboration. The Planning and Placemaking projects submitted for the year-long celebration of design share the consistent goal of advancing sustainability and equity for the 7.1 million living or commuting between the sister cities. These projects will showcase how design impacts the quality of life through plans for innovative transportation, area revitalization, and community building. This presentation will provide insight into the projects that uphold its mission of inclusivity, as well as emphasize how they will strengthen the connection of the San Diego-Tijuana region going forward.

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**604 3:00 pm 62**

### Medical Question and Answering Review

**Kristen Waterford, Biology/Bachelor of Science (U)**

This literature review aims to advance the understanding and implementation of Question-Answering (QA) systems within the domain of medical information retrieval, through the leveraging of cutting-edge techniques in Natural Language Processing (NLP) and large language models (LLMs). The exploration encompasses the intricate design and architectural methods behind QA systems, with a specific focus on the integration of knowledge graphs and the application of BERT, a bidirectional transformer-based LLM. The investigation is motivated by the pressing need for an efficient medical QA system, exemplified

in the context of addressing questions related to the COVID-19 pandemic. By scrutinizing the interplay between NLP, LLMs, and domain-specific knowledge, our aim is to contribute to the development of a robust and context-aware medical QA system, particularly suited for pandemic scenarios.

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**605 3:00 pm 63**

### Investigating Power Loss and its Impact on Disadvantaged Communities

**Arvin Domier, Master of Business Administration (M)**

The rise of extreme weather events due to climate change has simultaneously brought about an increase in both planned and unplanned outages, such as Public Safety Power Shutoff events. The goal of these shutoffs is to enhance public safety and prevent major wildfires during severe weather conditions, as well as to minimize the risk associated with fires igniting active power lines and causing further damage. While these planned de-energization events are designed to ensure community safety, they can have unintended negative impacts and actively harm disadvantaged communities. This presentation highlights case studies that delve into how different disadvantaged communities have felt the impacts of power shutoff events. The goal is to understand where investments have been made or can be made to improve community resilience in light of power loss events.

## Session I-10

Humanities, History, Literature, Philosophy

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

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**606 3:00 pm 64**

### Fear Embodied: Transforming Temor into Resistance Along the Borderlands

**Aurora Valdez De La Torre, Master's in Women's Studies (M)**

From a Chicana Latina Indigenous Feminist perspective, this research project highlights the ways in which the bodymindspirit of people from mixed-status families is affected while living along the border in a particular the San Diego-Tijuana border. Often times we live in fear due to our families documentation status which then leads to both internal and external issues. For those who reside in the San Diego-Tijuana live a unique third space that feminist Chicana theorist Gloria Anzaldúa calls the borderlands. This unique third space where the systems of dominance distinguish one group from another, establishing different levels of power and separating social groups based on nation, citizenship, race, ethnicity, gender, sex, sexuality, class, and more. The political state at the San Diego-Tijuana breeds an atmosphere of hierarchical binaries which stems from the impact of colonialism and imperialism as ongoing legacies that people continue to suffer and long to heal from.

This research uses the methods of autohistoria and pláticas with the intention to create connections and potential for

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healing. The racialized and gendered bodies, sexualities, and families of Latinxs are not often honored in dominant society. This research was inspired by my personal experience living in San Diego and being from a mixed-status family. Border conflicts were always talked about in my home. They were in the music we listened to, on the news every night, and I could see the border patrol presence around the city. The physical environment has an impact on the people living within it. In the location where I grew up this is especially true. Living and growing up in a highly militarized and patrolled area such as San Diego has had physical, spiritual, and emotional effects on my loved ones and myself. The aim of this project was to create space for collective healing for people in my community. Through pláticas we are able to practice deep listening and communication to honor our stories and resist the dehumanization of our communities.

**607 3:00 pm 65**

### Flora and Fauna Lexical Indicators for Prehistoric Movement of Yuman Peoples

**Jill Van Wormer, Master of Arts in Linguistics (M)**

This research is an analysis of flora and fauna lexical terms in order to determine the homeland of the Yuman language family. The location of each language group within the language family is mapped and the plant and animal resources important to each group listed. Lexical terms for those resources are compared within the language family and with other languages with whom they had contact to determine which terms are cognates within the language and which terms have been borrowed from other languages. This information can then be analyzed to figure out where the homeland is and where people moved from that homeland.

**608 3:00 pm 66**

### The Experiences of Autistic Adults in the Workplace: Characterizing Disclosure, Accommodations, and Job Termination

**Justice Herrera, Psychology (U)**

Background: Autistic individuals face challenges with disability disclosure and requesting workplace accommodations, but research suggests that doing so positively influences their work experiences. Understanding experiences related to disclosure, accommodations, and job termination is crucial to enhancing vocational support.

Objectives: The following questions were: 1) Do autistic adults report disclosing their disability, and if so, what do they disclose?; 2) What workplace accommodations are requested and received? 3) What are reported reasons for job termination?

Method: 139 autistic adults (mean age=25.17; 90M, 12F, 37 unknown gender; 53% White, 20% BIPOC [8% Hispanic], 27% unknown ethnicity) answered questions about current and past employment. The subset of questions analyzed focused on: disability disclosure, workplace accommodations, and job termination experience. Participants were enrolled in vocational services and answered the questions before starting

a vocational training program. 87 participants responded to at least one open-ended question regarding disclosure, accommodations, and job termination. Content analysis was used to categorize open-ended responses.

Results: 56 participants indicated they had disclosed a disability at work; 50 had not (33 did not answer or never had a job). Four categories were generated from responses about what participants disclosed: 1) Specific diagnosis; 2) General "disability"; 3) Specific Needs (e.g., trouble focusing); 4) Personal History (e.g., "Disclosed a bit of my interests"). 25 participants indicated they had received workplace accommodations; 76 did not (38 did not answer or never had a job). Four categories were generated regarding accommodations: 1) Vocational Assistance (e.g., job coaches); 2) Accommodations to work responsibilities (e.g., flexible deadlines/schedule); 3) Breaks; 4) Social-Emotional Support (e.g., social support during panic attacks). Regarding job termination, four categories were identified: 1) Amicable termination (e.g., seasonal job, quit for a better job); 2) Employee Perceptions (e.g., disliking the job); 3) Employer Perceptions (e.g., conflict with boss/others, not meeting standards); 4) Company changes (e.g., bankruptcy).

Conclusions: The preliminary results enhance our understanding of how autistic individuals disclose their disability and what accommodations they request. We can aim to reduce unwanted terminations by examining employer- and individual-level factors relevant to job termination.

**609 3:00 pm 67**

### Madeline Miller: "The Song of Achilles" & "Circe"

**Kristen Rivera, Bachelor of Arts in Applied Arts and Sciences (U)**

My presentation is the literary analysis of two books by a female author. I dive into women's literature to discuss and review all the themes and literary elements in two books. I explain the correlation between the two and how it has an impact on women's literature.

**610 3:00 pm 68**

### Life is Just a Bowl of Post-Racialism: The Black Discourse of Julia

**Jose Ramos Alonso, Bachelor of Science Emphasis in Critical Studies (U)**

This work delves into the distinct disparity between the televisual portrayal and real-life documentation of the 1960s, which signifies a profound ideological conflict about the nature of reality and television's role within it. A surge in African American pride and nationalism emerged, thus advocating for self-determination and empowerment. Referred to as black power, this movement emphasized racial esteem, economic autonomy, and the formation of cultural and political institutions. This era too witnessed an increased acceptance of African culture, and unfiltered artistic expression depicting the realities of African American lives. With television being a powerful medium, it attempts to navigate the evolving

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discourse on race and representation. 1960s television show Julia serves as a nuanced case study illustrating television's struggle to authentically depict the multifaceted experiences and aspirations of the Black community during this decade. It underscores the challenges and limitations inherent in mainstream media's attempts to represent the complex socio-political dynamics of that transformative period.

## Session I-11

Visual and Creative Arts

Friday, March 1, 2024 3:00 pm

Montezuma Hall

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**611 3:00 pm 69**

105 Miles from Home: Unveiling Operation Pedro Pan in a One-Act Play

**Alexis Hernandez, Bachelor/Liberal Studies with an Emphasis in Elementary Education Major and a Theatre Arts Minor (U)**

In a world where representation is vital, this one-act production endeavors to untangle the historical events leading up to Operation Pedro Pan and sheds light on the significance of historical entanglement in theater and the importance of Hispanic stories. With themes centralizing on redefining the American Dream, immigration, and the personal accounts of Operation Pedro Pan children, the production was crafted to tell the story of this pivotal event in American history while offering an open platform for Hispanic stories, supporting the need to amplify those stories.

In order to create a show that could capture the historical events and my family's experience into a stage production, I had to embark on a journey through various research methods. Ranging from articles to interviews, the script was written to be historically accurate. With a wide range of misinformation regarding Cuba, seeking the truth for this project was imperative.

After researching, the show was created. The script is filled with historically accurate events based on the overall exploration. The script has been a work in progress since 2020 until its professional debut at the San Diego International Fringe Festival. Leading to the initial performance, the cast and crew engaged in conversations centering on the show's topic and themes, including the need for Hispanic representation in theater. The community that viewed the show raved about the story and how it is, at the core, educational.

The show itself is a testament to the Hispanic stories that go untold in history courses or are spoken of for just a few moments. With the primary goal being education, "105 Miles from Home" was crafted for entertainment, with an agenda for education and the virtue of uplifting the Cuban and Hispanic communities by amplifying their history.

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**612 3:00 pm 70**

Tranquil Hub: Crafting Calm in Contemporary Design

**Kerry McEachern, MFA in Visual Arts and Graphic Design (M)**

"The Tranquil Hub" is a uniquely designed space that embodies an avant-garde blend of Mindfulness, Mind Relaxation, the Tamarkoz Method of meditation, Psychology, and contemporary design. This meticulously curated sanctuary caters to students and visitors seeking stress reduction and mental clarity during their busy day. The immersive space seamlessly integrates mind decluttering activities and guided meditation, offering easy access to a refuge and shelter from daily stressors.

Crafted with a predominantly contemporary aesthetic, the sheltering space provides a unique blend of immediate relief and long-term mind relaxation cultivation. Easily assembled in gallery or library spaces, it ensures convenient access for students navigating academic pressures. The design, characterized by natural materials, calming colors, and thoughtful elements, fosters an environment conducive to tranquility.

Designed for the use of one visitor at a time, the interior is furnished with uniquely crafted organizational structures symbolizing the compartments of the mind. Activities and objects available in the space prompt visitors to physically identify mental clutter, categorizing objects as manifestations of mental baggage. Through hands-on experiences, individuals engage in the physical act of organizing thoughts and stressors into labeled compartments such as Present, Past, Future, Priority, and Discard. This approach immerses viewers in a tangible act of mind decluttering and prioritizing tasks, crucial for managing the hectic student life.

Audio recordings featuring mind relaxation exercises enhance the experience, providing a self-guided journey to tranquility. Accessible during exhibition times or within library spaces, the self-serving nature of the space encourages autonomous exploration.

The project's goal is to actively engage students and visitors in mind decluttering and relaxation exercises through hands-on experiences, fostering a lasting impact. By equipping individuals with skills for mind relaxation and stress reduction, the project aims to reduce anxiety levels, ultimately enhancing concentration and focus—vital components of a successful and balanced academic life.

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**613 3:00 pm 71**

Dramaturgy in Video Games - Playing with Accuracy and Humanity

**Dean Vicedo, Masters of Arts in Theatre Arts (M)**

Art is a reflection of society, celebrating contemporary culture and reflecting humanity from which it was conceived. Film and television are common modes of artistic entertainment that are digestible straight from a sofa at home. Theater, on the other hand, is a traditional form of art that is not as easily accessible. One form of art that is not theater but still accessible like television is video games. An art form most common with a younger audience, video games are immersive pieces of entertainment that can portray a wide variety of stories with a plethora of heavy themes. These themes, however, are not as delicately handled as they are with theater and film, even though the games they come from can be easily bought at the

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store. Dramaturgy is the theatrical practice of research that allows for creative teams to properly study the concepts and themes presented in their productions in order to appropriately portray those delicate ideas. Video games should have a resident dramaturg within their artistic teams just like other theatrical productions to ensure their stories' themes are handled with proper care. For example, there are video games that portray certain cultures without proper representation, and their lack of education shows a lack of respect for said cultures. Dramaturgs provide insight to make sure these teams understand the importance of depicting specific people and not just showing a caricature of their culture. Implementing a theatrical researcher would allow for improved wider team education and improved plot development, cultivating an ethical, educated story that honors the humanity they've created for others to immerse themselves within and celebrate a reflection of our society.



# Abstracts of Presentations

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## Session J

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## Session J-1

Visual Arts Exhibits

Friday, March 1, 2024 11:00 am

Montezuma Hall

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### 700 11:00 am

Holy Smokes

**Molly Fitzgerald, Bachelor of Fine Arts, (U)**

Within my artistic expression, the interplay of Catholic satire and childhood memories weaves a distinctive narrative, engaging viewers in a contemplative dance between irreverence and nostalgia.

In the realm of Catholic satire, my art becomes a whimsical commentary on the sacred and the mundane. Whether through paintings, drawings, or ceramic sculptures, I employ a satirical lens to playfully dissect and question elements of Catholicism. This could manifest in irreverent depictions of traditional symbols, humorous reinterpretations of religious narratives, or sly nods to the rituals and customs ingrained in Catholic culture. The juxtaposition of the solemnity associated with Catholicism against the irreverent twist of satire creates a dynamic tension, prompting viewers to reassess preconceived notions and fostering a dialogue between the sacred and the profane.

Simultaneously, childhood memories emerge as a poignant motif, adding depth and emotional resonance to the narrative. The innocence and vulnerability inherent in childhood provide a canvas upon which to explore universal themes of growth, loss, and the fleeting nature of youth. The use of nostalgic imagery, perhaps drawn from personal experiences or collective cultural memories, invites viewers to connect with their own childhood narratives. The juxtaposition of Catholic satire against the backdrop of childhood memory creates a rich, textured experience that resonates on both personal and universal levels.

For instance, a satirical rendering of Catholic rituals within the context of a childhood playground might depict youthful innocence coexisting with irreverent humor. The juxtaposition of holy symbols in a whimsical, childlike setting could evoke a range of emotions—from laughter at the satire to a reflective nostalgia for the carefree days of youth. Through this synthesis of elements, the artwork becomes a portal, inviting viewers to explore the complex interplay between faith, satire, and the enduring imprints of childhood on our perceptions of the world.

In essence, my art becomes a vessel for storytelling—one that employs satire to question, challenge, and redefine elements of Catholicism, while simultaneously drawing upon the evocative power of childhood memories to elicit emotional connections and introspection. It is within this intricate dance between satire and nostalgia that the true essence of my artistic narrative unfolds, inviting viewers to navigate the delicate balance between humor, reflection, and the enduring echoes of youthful experiences.

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### 701 11:00 am

For Shirley

### Anisa Prom, English, (U)

This piece is a recreation of a painting that was lost in my family. My maternal grandmother was a great artist and painted many pieces that have since been scattered throughout time and the extended family. In honor of her, I decided to recreate one of her pieces for my mom so she could see her mom's work come to life again. The original work was painted on a canvas but I merged my love for digital art into the new piece, merging both of our styles throughout the generations. I hope now more people can see her art too and can also enjoy and be inspired by her skill.

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### 702 11:00 am

No More Brownfields: Branding for Community Outreach

**Kieran Gomez-Rodriguez, Art, Emphasis in Graphic Design, (U)**

The National City Brownfields Assessment Project is an initiative of the SDSU Center for Regional Sustainability (CRS) in collaboration with the National City community. For this project I implemented a branding system, which included defining the look and feel of the initiative's digital and print collateral. As part of the design process, I researched the population demographics, the Latino and Asian visual culture, and the history of National City. Auto-ethnographic methods were also used as part of the investigations for the aesthetic and tone directions of the brand system.

National City has a majority Latino and Asian population, and is disproportionately affected by environmental racism. Due to zoning laws not coming into effect until after settlement and industrialization had taken place, many residences are adjacent to heavy industry and abandoned sites that formerly or currently are contaminated. Because of this proximity between housing and industry the residents of National City are at higher risk of developing health problems than those elsewhere in the county.

The challenges of this project included balancing the amount of information delivered to the public through the design, moving away from alienating academic language towards a more casual and friendlier tone, making sure to be clear on the intentions and limitations of the Brownfield Assessment Project, and emphasizing the need for community input and mutual collaboration between SDSU and National City community members. Other considerations included the use of multi-lingual support in choosing typography and in the use of messaging, and creating a graphics system that is accessible for reuse to a non-designer.

On the poster design, large, hand-lettered titles mirror the spirit of protest and activism, as well as reference graffiti and murals—both of which are prevalent in Latino and Asian visual culture. This is combined with a color system that represents these vibrant cultures, and also serves to indicate progress. The city grid for National City was used as a graphic element that both contains crucial information to encourage community engagement, and photography that add to the sense of community and belonging, and allow for envisioning future possibilities.

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(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Session J-2

Visual Arts Exhibits

**Friday, March 1, 2024 3:00 pm**

Montezuma Hall

### 703 3:00 pm

Please Touch the Art! How Costume Technology Can Create Inclusive “Touch and See” Experiences

**Sabrina Soto, Theatre Arts with an Emphasis in Design and Technology, (U)**

This project explores my work researching and constructing a half-scale, three-dimensional replica of the dress worn in the Timken Museum’s famous painting: Portrait of a Lady in a Green Dress for the museum’s newest accessibility initiative. This Timken Museum sponsored project aims to make existing art pieces within their collection more accessible for the blind and visually impaired through touch-based experiences. With the completion of this project, this costume replica will be featured next to its portrait as an inclusive resource for the visually impaired to experience the two-dimensional portrait in the form of touch, and in theory to “see” it with their own hands. I will also include where this project looks to expand its use of costume technology to offer other inclusive touch-based opportunities in similar environments.

### 704 3:00 pm

The Personal Aesthetics of Memory and Mood

**Jonathan Rodley, MFA Painting, Printmaking, (G)**

From an appreciation of metaphysical poetics and an acknowledgement of the cognitive science which coincides with a poststructuralist understanding of mind and representational signs, my artwork aims to balance an ontological approach to memory with a phenomenological understanding of mood and emotion by using a pluralism of abstract aesthetics from the 20th century to express personal feelings on the human condition.

### 705 3:00 pm

I Asked AI (1-6)

**Marinta Skupin, MFA Art, (G)**

My work probes our relationship with the natural environment. I utilize imagery, scientific data, and language in order to explore multiple ways of knowing and of expressing the world. Among the media I use are painting, drawing, printmaking, and digital media.

In addition to being inspired by physical features of the natural world, my work is informed by reflections on the history of landscape painting and on issues such as extinction and the predicted climate apocalypse.

The statements in this series are from answers generated by ChatGPT, in response to the question “What will we miss most in the event of a climate apocalypse?” The works were created

using laser-based engraving on paper.

Examining the role that data plays in enhancing our understanding of the environment, I contemplate how scientific and technological advances influence the way we see and experience the world.

Language is central to my work. I have been intrigued by the role of Afrikaans, my mother tongue, in the shaping of my consciousness. Contemplating the theme of loss, I consider how the loss of one’s language could extend to the loss of the world.



# Abstracts of Presentations

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## Session K

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(U) = Undergraduate; (M) = Masters; (D) = Doctoral

## Session K-1

Performance Arts

Friday, March 1, 2024 9:00 am

Montezuma Theater

### 7 9:05 am

Tina Tina Bo Bina

**Jessica Ebert, Television, Film, and New Media Production (U)**

Throughout the summer, Jessica Ebert and Jordan Eichhorn worked through the multiple stages of pre-production, production, and post-production for the short film "Tina Tina Bo Bina" alongside acclaimed writer, director, and San Diego State University professor, Jessica McGaugh. Our project's goal is to produce a film centered around female empowerment and social issues. Through "Tina Tina Bo Bina," we shed light on the challenges women encounter as they endure societal pressure and expectations, pursue their ambitions, and overcome creative endeavors. Furthermore, we are examining how women are expected to navigate the balancing act of family life, child care, and life's stressors while trying to make a name for themselves.

We learned a lot of valuable skills that we will implement in the future of our filmmaking careers, such as how the independent filmmaking production process runs, how to acquire funding through grants and fundraising, and how to distribute a short film, all while gaining more experience that will strengthen and hone our skills as artists. During "Tina Tina Bo Bina," Jessica Ebert acted as the production manager, coordinating the crew, handling catering and meals, keeping track of expenses and paperwork, and tackling other production logistics. Following production, we wrote expense reports, provided creative feedback, created timelines for film festival submissions, and even developed an email in order to raise festival and post-production funds. Our time consisted of applying for grants, searching for female filmmakers for season two of Womanhood: The Series, scouting locations, breaking down the script, and other organizational projects. All of this led to the creation of an outstanding short film.

### 8 9:35 am

Clones

**Mark Heine, BSBA in Information Systems (U)**

The original music video, "Clones", which I created for SDSU student musical artist Ze66y (Zebediah Stiers) represents an effective collaboration of music and visual artistry/techniques.

### 9 10:05 am

Overcoming

**Reed Funes Smith, MFA In Film and Television Production (G)**

A Paralympic swimmer works to overcome her disability of Arthrogyrosis Multiplex Congenita with the full use of only one arm to swim the butterfly stroke, one of the hardest strokes in swimming, at an elite level. This documentary short film follows

Nelya Schasfoort of SDSU Adapted Athletics and Team USA as she works with her physical therapists Olivia Zina and Madison Hurst to build strength and resilience as she sets her sights on her dream of competing at the 2024 Paralympic Games next summer in Paris. This is a story of defying the odds to pursue success through hard work, supportive relationships, and perseverance.

### 10 10:35 am

The With;OUT Dance Project: Community Dancemaking

**Robert Taylor, Masters of Arts in Liberal Arts and Science (focus in Dance, Queer, and Somatic Studies) (G)**

Ohad Naharin, creator of the dance form Gaga and Artistic Director of the Batsheva Dance Company in Tel Aviv, Israel guides us in our practice by saying, "We never look at ourselves in a mirror, there are no mirrors. We become better aware of our form. We connect to the sense of the endless of possibilities". When we think about how we teach and create dances here in the United States, we are met with the assumption that we will gather in front of the room mirrors and copy the choreographer and their movements. Let's let go of that for just a moment.

I argue that Ohad was onto something here in how we come together as a community to dance and to feel connected with our bodies--transforming how we present ourselves in the world. Some people identify with a certain faith, sexuality, nationality, or gender, but also some people have impairments. Some people struggle with mental and physical illnesses that hinder them from leaving their house, or to go be social, or even as vital as sleeping in a bed.

I further explain the endless possibilities of moving together. What does it mean to have people come together and deviate from their daily lives? To step outside of their comfort zone to do something as shake, bounce, flick, tap, or breathe. I intend to invite anyone willing to try this extraordinary practice informed by Ohad Naharin's dance form Gaga, to move together as one community. Following Robin Nelson's Guide to Practice as Research in the Arts and Beyond I aspire to present something that isn't just for mere entertainment but gives you the choice to try something new and discover ways of moving you didn't think were possible. Gaga dance, created by Ohad Naharin, has even helped me rediscover my love for performing and my passion for dancemaking after an injury. Let's break away from the mirror, let's dance!

## Session K-2

Performance Arts

Friday, March 1, 2024 1:00 pm

Montezuma Theater

### 11 1:05 pm

Here With You

**Emily Deskin, Bachelor of Fine Arts in Dance (U)**

Our research is an exploration of touch, desire, and desperation

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through the lense of our relationship. This exploration delves into our unique relationship as two female presenting artists who are co-collaborators, friends, dancers, and roommates. Our connection was built not only from verbal, but also through tactile communication. This has created a level of intimacy which is often misunderstood. We realized this through the comments from peers and strangers, thus sparking our inspiration for this research. Since the Spring of 2023 we have been researching desire, and how it shows up through our dancing. This led us to work with one of our faculty in a mentorship program, where we honed our understanding of techniques such as Authentic Movement and Contact Improvisation. Through this research we have developed a deeper understanding of relationships and how intimacy can be perceived in today's society.

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## 12 1:35 pm

### Sync or Swim

**Arwyn Higgins, Dance (U)**

Our duet is thematically centered around contrast. The contrast between humans and animals, between quick and sustained movement, between dance and play, and even more relationships with contrast we are continuing to research. We explore these contrasting relationships by attending to space, the audience, as well as one another through our movement. With each of us growing up in the competitive dance circle, we are researching a piece that simultaneously has structure and ambiguity. We aim to seamlessly walk (or dance) between the line of concrete and abstract.

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## 13 2:05 pm

### Dancing Beyond Boundaries: Exploring Rules, Class Disparities, and Identity in Ballet and Breaking

**Chasle Schoettle, Dance & Kinesiology Pre-PT (U)**

My research explores the rules and class disparities of two unique dance forms, ballet and breaking. As a late-blooming dancer with a hip hop background, I am interested in the cultural and political elements of these two forms of dance. Despite their historical separation, I intend to fuse ballet and breaking in order to have a better knowledge of my identity as a dancer. "What if my technical dance is fiction and my drama is the truth?" is the fundamental question that I will constantly be playing with during my process. Concurrent training helps me gain access to myself, resulting in a voyage of self-discovery and the integration of various dance elements that were previously unknown.

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## 14 2:35 pm

### Entremedio/ In between

**Alyssa Moreno, Bachelor of Fine Arts in Dance (U)**

As a Mexican-American who has experienced life in its majority in Tijuana, México crossing the border to San Diego, CA often, I have always thought of myself as someone who is constantly between countries, cultures, languages, relationships, etc.

I live here and there, on both sides of the border, speaking Spanish and English daily. After spending the past summer working with my teacher and mentor Jess Humphrey and friend Chazley Schoettle (Chazz) with the support of the Summer Undergraduate Research Program (SURP), the journey to questioning, acknowledging, losing, finding, and redefining myself began. The ability and privilege I have to exist in both places is the base and heart of my research.

I have realized that being part of two cultures has not been easy for me and discovered that although I am the same person anywhere I go, I do not always feel that way. I often feel like a part of myself is lost whenever I am in México, and vice versa. A part of me feels blocked/unavailable when I am in an English-speaking context. These blockages present themselves in distinct areas of my life, such as communication skills, body language, confidence, creativity, and the way I dance. My research consists of attempting to access and hold both sides of myself in their most absolute and complete form while dancing. Through dance, I explore and try to blur the divide between my Mexican and American selves. The process and result of this research cannot be measured or calculated, but its effect on me goes beyond dance. The goal is to explore the intricate reality of being a bicultural human. With dance as my research method, I have begun to discover what and how each culture influences my life.



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