March 3 and March 4, 2017



Tenth Annual Student Research Symposium

A Showcase of Student Discovery and Innovation

Celebrating the achievements of SDSU student research, scholarship and creative activity



Leadership Starts Here





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Charles Wei-hsun Fu Foundation













Tenth Annual Student Research Symposium

March 3 and March 4, 2017

Celebrating the achievements of San Diego State University students in research, scholarship & creative activity







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Elliot Hirshman President San Diego State University



THE PRESIDENT

San Diego State University 5500 Campanile Drive San Diego, CA 92182-8000 Tel: 619 594-5201 Fax: 619 594 8894

March 3, 2017

Dear colleagues and guests:

Welcome to the 2017 Student Research Symposium at San Diego State University - the 10th anniversary of this university-wide event that highlights the outstanding research and creative endeavors that distinguish SDSU. It is an opportunity to celebrate the innovation, academic scholarship and creativity that our undergraduate and graduate students bring to their research and a forum for sharing their discoveries, insights and performances with a broader audience.

More than 450 students are presenting their original work that emerged from academic and creative endeavors across the university. More than 50 awards

for excellence will be presented, and 10 students whose entries are judged exceptional will represent SDSU at the annual California State University Student

Our dedicated faculty and staff have encouraged students in their research and are coordinating this symposium. More than 200 volunteers from our faculty and staff and the greater San Diego community are sharing their time and expertise to evaluate the oral, poster, exhibit and performance presentations. I am grateful for these efforts, which demonstrate SDSU's commitment to cutting-edge research and creative endeavors.

I hope you will enjoy the symposium and the outstanding collaborative work of our students, faculty and staff. This vibrant exploration of ideas defines us as a

With best regards,

Elliot Hhh

Elliot Hirshman President



William F. Welsh, Jr. Professor of Astronomy, San Diego State University

Dr. William Welsh joined SDSU in 2000, following postdoctoral fellowships at the University of Texas at Austin, and Keele University, England. He earned his PhD in Astronomy from The Ohio State University in 1993, and his BS degree from the State University of New York at Stony Brook. Between his undergraduate and graduate studies, he worked at the Space Telescope Science Institute, the operations center for NASA's *Hubble* telescope.

Soon after arriving at SDSU, Dr. Welsh focused his research on extrasolar planets, a new and explosively growing field of astronomy. In 2008 he was selected by NASA to join the Science Team of the *Kepler* Mission, a spectacularly successful project that has resulted in the discovery of well over 2000 new planets.

Most notably, Dr. Welsh has been involved in the study of "circumbinary planets", a new class of planet that he helped establish. Like the fictional Star Wars planet *Tatooine*, circumbinary planets orbit around two stars, not just one. Welsh and collaborators at SDSU have become the world's foremost experts in the detection and characterization of circumbinary planets, and their discoveries have earned worldwide attention.

Dr. Welsh loves sharing his research in his courses, his favorite classes being "Astrobiology" and his Honors course "How Do We Know That?". In step with his passion for student education, he lived on campus as part of the "Faculty In Residence" program from 2007-2009. Devoted to public education, he has given numerous public talks, worked with K-12 science teachers, and has contributed to many news articles. In 2013 he published an article in Scientific American for the general public.

Dr. Welsh has co-authored over 90 refereed publications, including papers in Nature and Science, and has been PI on eleven federally funded research grants. He has served on numerous panels for NASA and the NSF, and is participating in NASA's upcoming exoplanet mission, *TESS*. In 2015, Dr. Welsh was honored with SDSU's College of Sciences "Monty" Award for Outstanding Faculty Contributions.

Thursday, March 2 - Registration

1:00 pm – 4:00 pm Registration Aztec Student Union, Montezuma Lounge

Opening Remarks

8:30 am – 9:00 am Elliot Hirshman, President, SDSU

Aztec Student Union, Theatre, Room 270

Friday, March 3 - Sessions A & B

8:00 am – 4:00 pm Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	A-1	Oral	Health Nutrition & Clinical Sciences OR1	Pride Suite
	A-2	Oral	Behavioral & Social Sciences OR1	Park Boulevard
	A-3	Oral	Physical & Mathematical OR1	Tehuanco
	A-4	Oral	Biological & Agricultural Sciences OR1	Aztlan
	A-5	Oral	Behavioral & Social Sciences OR2	Metztli
	A-6	Oral	Humanities OR1	Templo Mayor
	A-7	Oral	Business, Economics & Public Administration OR1	Visionary Suite
	A-8	Oral	Engineering & Computer Science OR1	Legacy Suite
9:00 am	A-9	Poster	Behavioral & Social Sciences P1	Montezuma Hall
	A10	Poster	Interdisciplinary P1	Montezuma Hall
	A11	Poster	Engineering & Computer Science P1	Montezuma Hall
	A12	Poster	Physical & Mathematical Sciences P1	Montezuma Hall
	A13	Poster	Health Nutrition & Clinical Sciences P1	Montezuma Hall
	A14	Poster	Behavioral & Social Sciences P2	Montezuma Hall
	A15	Poster	Business, Economics & Public Administration P1	Montezuma Hall
	A16	Poster	Engineering & Computer Science P2	Montezuma Hall
	A17	Poster	Health Nutrition & Clinical Sciences P2	Montezuma Hall
11:00 am	B-1	Oral	Physical & Mathematical OR2	Pride Suite
	B-2	Oral	Biological & Agricultural Sciences OR2	Park Boulevard
	B-3	Oral	Behavioral & Social Sciences OR3	Tehuanco
	B-4	Oral	Visual or Performing Arts OR1	Aztlan
	B-5	Oral	Biological & Agricultural Sciences OR3	Metztli
	B-6	Oral	Behavioral & Social Sciences OR4	Templo Mayor
	B-7	Oral	Humanities OR2	Visionary Suite
	B-8	Oral	Education OR1	Legacy Suite
10:45 am	B-9	Poster	Behavioral & Social Sciences P3	Montezuma Hall
	B10	Poster	Physical & Mathematical Sciences P2	Montezuma Hall
	B11	Poster	Biological & Agricultural Sciences P1	Montezuma Hall
	B12	Poster	Health Nutrition & Clinical Sciences P3	Montezuma Hall
	B13	Poster	Behavioral & Social Sciences P4	Montezuma Hall
	B14	Poster	Interdisciplinary P2	Montezuma Hall
	B15	Poster	Biological & Agricultural Sciences P2	Montezuma Hall
	B16	Poster	Engineering & Computer Science P3	Montezuma Hall
	B17	Poster	Behavioral & Social Sciences P5	Montezuma Hall

Friday, March 3 - Sessions C, D, E, F & G

8:00 am – 4:00 pm Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
1:00 pm	C-1	Oral	Behavioral & Social Sciences OR5	Pride Suite
-	C-2	Oral	Education OR2	Park Boulevard
	C-3	Oral	Biological & Agricultural Sciences OR4	Tehuanco
	C-4	Oral	Behavioral & Social Sciences OR6	Aztlan
	C-5	Oral	Humanities OR3	Metztli
	C-6	Oral	Interdisciplinary OR1	Templo Mavor
	C-7	Oral	Engineering & Computer Science OB2	Visionary Suite
	C-8	Oral	Physical & Mathematical OR3	Legacy Suite
12:30 pm	C-9	Poster	Biological & Agricultural Sciences P3	Montezuma Hall
·	C10	Poster	Behavioral & Social Sciences P6	Montezuma Hall
	C11	Poster	Engineering & Computer Sciences P4	Montezuma Hall
	C12	Poster	Physical & Mathematical P3	Montezuma Hall
	C13	Poster	Behavioral & Social Sciences P7	Montezuma Hall
	C14	Poster	Biological & Agricultural Sciences P4	Montezuma Hall
	C15	Poster	Health Nutrition & Clinical Sciences P4	Montezuma Hall
	C16	Poster	Engineering & Computer Sciences P5	Montezuma Hall
	C17	Poster	Behavioral & Social Sciences P8	Montezuma Hall
3:00 pm	D-1	Oral	Humanities OR3	Pride Suite
	D-2	Oral	Engineering & Computer Science OR3	Park Boulevard
	D-3	Oral	Business, Economics & Public Administration OR2	Tehuanco
	D-4	Oral	Behavioral & Social Sciences OR7	Aztlan
	D-5	Oral	Biological & Agricultural Sciences OR5	Metztli
	D-6	Oral	Physical & Mathematical OR2	Templo Mayor
	D-7	Oral	Visual or Performing Arts OR4	Visionary Suite
	D-8	Oral	Behavioral & Social Sciences OR8	Legacy Suite
2:15 pm	D-9	Poster	Behavioral & Social Sciences P9	Montezuma Hall
	D10	Poster	Physical & Mathematical P4	Montezuma Hall
	D11	Poster	Engineering & Computer Science P6	Montezuma Hall
	D12	Poster	Behavioral & Social Sciences P10	Montezuma Hall
	D13	Poster	Biological & Agricultural Sciences P5	Montezuma Hall
	D14	Poster	Behavioral & Social Sciences P11	Montezuma Hall
	D15	Poster	Engineering & Computer Science P7	Montezuma Hall
	D16	Poster	Behavioral & Social Sciences P12	Montezuma Hall
4:00 pm	E-1	Poster	Engineering & Computer Science P8	Montezuma Hall
	E-2	Poster	Biological & Agricultural Sciences P6	Montezuma Hall
	E-3	Poster	Physical & Mathematical P5	Montezuma Hall
	E-4	Poster	Education P1	Montezuma Hall
	E-5	Poster	Behavioral & Social Sciences P13	Montezuma Hall
	E-6	Poster	Biological & Agricultural Sciences P7	Montezuma Hall
	E-7	Poster	Behavioral & Social Sciences P14	Montezuma Hall
9:00 am	F-1	Exhibit		Montezuma Hall
1:30 pm	G-1	Performance Arts		Montezuma Theatre

Saturday, March 4 - Sessions H & I

8:00 am – 11:00 am Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	H-1	Oral	Interdisciplinary OR2	Pride Suite
	H-2	Oral	Health Nutrition & Clinical Sciences OR2	Park Boulevard
	H-3	Oral	Engineering & Computer Science OR4	Tehuanco
	H-4	Oral	Behavioral & Social Sciences OR9	Aztlan
	H-5	Oral	Humanities OR4	Metztli
	H-6	Oral	Behavioral & Social Sciences OR10	Templo Mayor
11:00 am	-1	Oral	Biological & Agricultural Sciences OR6	Pride Suite
	1-2	Oral	Behavioral & Social Sciences OR11	Park Boulevard
	1-3	Oral	Engineering & Computer Sciences OR5	Tehuanco
	1-4	Oral	Behavioral & Social Sciences OR12	Aztlan

12:30 pm - 1:30 pm Lunch Reception Goldberg Courtyard

2:00 pm - 3:30 pm Keynote and Award Ceremony

Awards will be presented at the Ceremony on Saturday, March 5, to recognize the most outstanding presentations of research, scholarship, and creative activity at the Student Research Symposium. The awards are as follows:

President's Awards for Research

President's Awards of \$500 will be given to the ten outstanding presentations in discipline-specific categories. Those receiving a President's Award will represent SDSU at the California State University (CSU) Student Research Competition on April 29th and 30th, 2016, at CSU, Bakersfield.

President's Award for the Arts

A President's Award of \$500 will be given to the outstanding presentation in the performance arts or exhibit category.

Provost's Awards

Several Provost's Awards (\$150) for outstanding poster presentations will be selected from all poster entries shown at the Symposium.

Dean's Awards

Dean's Awards of \$250 each will be given for oral presentations. Awards will go to the top presentations in each college. One award will go to the top presentation from the Imperial Valley Campus.

Scholars Without Borders/International Award

Scholars Without Borders is an honorary society dedicated to promoting international exchange and service and recognizing scholarly achievement in an international context. This award provides an additional \$100 award for presenters who receive President's or Dean's award for work conducted internationally.

The Charles Wei-hsun Fu Foundation Award for Research in Philosophy

The Charles Wei-hsun Fu Foundation will award \$500 to the best oral presentation in Philosophy.

Library Awards

Several awards from the Library of \$250 each (both undergraduate and graduate) will be given for the best projects using library resources and collections, including, but not limited to, printed resources, databases, primary resources, and materials in all media.

Undergraduate Research Excellence Awards

Several undergraduate research will each receive \$150 in recognition of their scholarly achievement. These students will be selected from both oral and poster presentations.

Outstanding Compact Scholar Researcher Award

\$250 will be awarded to the student with the highest oral or poster presentation score completed by an undergraduate researchers who is also a member of the Compact Scholars Program. Compact Scholar eligibility must be verified before the award is issued.

Research Awards for Diversity, Inclusion, and Social Justice

Diversity, social justice, and inclusiveness reflect some of the values at the core of our university mission. Four \$250 awards will be presented jointly by the Chief Diversity Officer, the Division of Graduate and Research Affairs, and the Division of Undergraduate Studies for the two best undergraduate and two best graduate student research presentations that exemplify our ongoing commitment to diversity, inclusion, and social justice.

Women in Engineering Awards

Two awards will be given for the two best engineering presentation by women.

Creative and Performing Arts Awards

In addition to the President's Award for the Arts, other creative and performing arts awards are under development and will be announced at the event.

Women in Business Award

The Fowler College of Business Administration will award \$250 to the top business presentation by a woman.

Future Business Leader Award

The Fowler College of Business Administration will award \$250 to the top presentation in business leadership.

A Note About The Awards

Students receiving one award will not be considered for additional awards unless otherwise specified.

Saturday, March 5, 2017

Reception:

12:00 pm - 1:30 pm, Aztec Student Union, Goldberg Courtyard

Keynote Address and Awards Ceremony:

2:00 – 3:00 pm, Aztec Student Union, Montezuma Hall Saturday afternoon events are open to all student presenters, mentors, and judges.

Awards Ceremony 2017 Student Research Symposium

Welcome Keynote Address Awards*

Undergraduate Research Excellence Awards Outstanding Compact Scholar Researcher Award Research Awards for Diversity, Inclusion and Social Justice Philosophy Award Library Awards Women in Engineering Awards Awards for Outstanding Creative & Performing Arts Women in Business Award Future Business Leader Award Deans Awards Provost's Awards President's Awards

Closing Remarks

* 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.



Creative Arts Exhibits and Presentations

Friday, March 3, 2017

Sessions F and G

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



Friday, March 3, 2017 Session F: Creative Arts Exhibits

Session F-1

Art Exhibit

Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

511 9:00 am

Plexus: A Study in Nonlinear Storytelling Cathy Nguyen, Graphic Design (M)

Friday, March 3, 2017 Session G: Creative Arts Presentations

Session G-1

Performing Arts Friday, March 3, 2017, 1:30 pm Location: Montezuma Theater

512 1:30 pm

Helen Tamiris: Patriot Choreographer **David Watson, Musical Theatre (M)**

513 1:50 pm

The 21st Century Voice Teacher: A Perspective on Current Musical Theatre Training in Higher Education **Kimberly Moller, Musical Theatre (M)**

514 2:10 pm

Cultivating Social Emotional Growth through Theatre and Performance Kimberly King-Smithson, Theatre Arts (M)

515 2:30 pm

A Sequential Approach to Developing Musical Literacy in Beginning Violin **Quyen Nguyen, Music Performance (U)**

516 2:50 pm

Conference Showcasing: Creating Financially Sustainable Music Ensembles Gustavo Alcoser, Latin American Studies (M)

517 3:10 pm

To See or Not to See Aubrhe Yruretagoyena, Dance (U)

518 3:30 pm

Everyday American Women Anna Conkey, English, Journalism (U)



Oral Presentations

Friday, March 3, 2017

Sessions A, B, C and D

Saturday, March 4, 2017

Sessions H and I

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



Friday, March 3, 2017 Session A: Oral Presentations

Session A-1

Oral Presentation: Health Nutrition & Clinical Sciences OR1 Friday, March 3, 2017, 9:00 am

Location: Pride Suite

100 9:00 am

Understanding the relationship between physician referral practices and timeliness of care in patients with Colorectal Cancer **Cheri Morgan, Public Health (U)**

101 9:15 am

Association Between Physical Activity and Mechanical Pain Sensitivity Jaime Zinn, Kinesiology Pre-Physical Therapy (U)

102 9:30 am

Understanding the relationship between language accessibility, discharge instructions and hospital readmission Fathiya Abdi, Public Health (U)

103 9:45 am

Is There a Relationship Between Edentulism and Quality of Life? Daisy Lopez, Public Health (U)

104 10:00 am

Phenolic Content and Antioxidant Activities of Red and Green Sichuan Peppers Mary Ann Marroquin, Foods & Nutrition (U)

Session A-2

Oral Presentation: Behavioral &

Social Science OR1

Friday, March 3, 2017, 9:00 am

Location: Park Boulevard

105 9:00 am

Ambivalent Supervision: Negative Outcomes and Cross-Domain Buffers **Riley Johnson, Psychology (U)**

106 9:15 am

Grown-Ups at Play: Disneybound & Fan Performance at Disneyland Mar-Kell Law, Communication (M)

107 9:30 am

Measuring Personality-Performance Relationships: A Person-Centered Approach Caitlin Jacobson, Psychology, Industrial and Organizational (M)

108 9:45 am

The Opportunity Cost of Love: Couples Negotiating Perceptions of Alignment in the Workplace **Torey Romero, Communication (M)**

109 10:00 am

Structural empowerment in nursing groups: A dominance analysis approach Dustin Abbott, Psychology, Industrial and Organizational (M)

Session A-3

Oral Presentation: Physical & Mathematical OR1 Friday, March 3, 2017, 9:00 am Location: Tehuanco

110 9:00 am

Q-plates with Quarter Wavelength Retardance Isaiah Abella, Physics (U)

111 9:15 am

Vector Beam Polarization State Spectrum Ananlyzer Joseph Holland, Physics - Modern Optics (U)

112 9:30 am

Constant-Q Filter Banks For Identifying Odontocete Whistles Bryan Tran, Computer Science (M)

113 9:45 am

Empirical wavelet frames for signal processing Antonio Silveti-Falls, Applied Mathematics (M)

114 10:00 am

PETSc based parallelization of the fully 3d-curvilinear non-hydrostatic Coastal Ocean Dynamics model, GCCOM Manuel Valera, Computational Science (D)

115 10:15 am

Enhancement of Silicon Solar Cells via the Attachment of Silver Nanoparticles Martha Zepeda Torres, Physical Chemistry (D)

Session A-4

Oral Presentation: Biological & Agricultural Sciences OR1 Friday, March 3, 2017, 9:00 am Location: Aztlan

116 9:00 am

A Hydroponic Study of the Effects of UV Transmittance on Nutrient Dense Vegetables Allison Rinehart, Environmental Science (U)

117 9:15 am

Correlation Between Precipitation, Water Quality, and Detection of Phage-encoded Shiga Toxin Gene Along San Diego Coast Tess Condeff, Biology (U)

118 9:30 am

Elucidation of UNC-45 function using FRET Abdallah Ashour, Biology (U)

119 9:45 am

Defects in Skeletal Muscle Function Associated With Expression of Human Myosin Dilated Cardiomyopathy Mutations in Drosophila Hassler Rengifo, Biology (U)

120 10:00 am

Influence of the Potential Therapeutic VAX-IP on Colorectal Tumor Growth Savannah Sawaged, Biology (U)

121 10:15 am

Fast and efficient comparison of metagenome sequences from patients **Byron Garcia, Computer Science (U)**

Session A-5

Oral Presentation: Behavioral & Social SciencesOR2

Friday, March 3, 2017, 9:00 am Location: Metztli

122 9:00 am

How Crisis Communication Theory Affects Nonprofit Civil Rights Organizations Zackary Albrecht, Journalism, Emphasis in Public Relations (U)

123 9:15 am

Framed: A Political Framing Experiment in Public Relations **Dylan Grise, Journalism, Public Relations (U)**

124 9:30 am

Communicating Commitment Through Activism: Individual Actualization and Creating Common Ground Through Activist Organizing Jonathan Veal, Communication (M)

125 9:45 am

The Role of Civil Society in Implementing UNSCR 1325 in Africa's Great Lakes Region Claire Schmitt, International Security and Conflict Resolution (U)

126 10:00 am

Sustainable Development in Developing and Post-Conflict Nations Connor Rutledge, Sustainability (U)

Session A-6

Oral Presentation: Humanities OR1 Friday, March 3, 2017, 9:00 am

Location: Templo Mayor

127 9:00 am

The Syrian Refugee Crisis: Examining Right-Wing Populist Party Influence on EU Immigration Policy Jessie Dietz, Political Science (U)

128 9:15 am

Law 348: The Struggle to End Violence Against Women in Bolivia Emma Mackey, Latin American Studies (M)

129 9:30 am

Dos Crímenes: Parody and Questioning of Mexico's Dirty War Jovana Gomez, Spanish (M)

130 9:45 am

The Child Assimilation Agenda: The Connections between Federal Indian Policy and Indian Representations in DC Comics **Desmond Hassing, Theatre (M)**

131 10:00 am

Landfill Harmonic: Ecomusicology and Activism Kathryn Smart, Musicology (M)

Session A-7

Oral Presentation: Business, Economics &

Public Administration OR1

Friday, March 3, 2017, 9:00 am

Location: Visionary Suite

132 9:00 am

A Hierarchical Aspect-Based Sentiment Analysis of Online Reviews for Business Consulting Sunny Kim, MSIS (M)

133 9:15 am

The Influence of San Diego State University on College Area Property Values Jeremiah Taylor, Real Estate (U)

134 9:30 am

Iraq; The Growing Economy and Business Opportunities Naba Al-jawad, International Business (U)

135 9:45 am

Solar Power: Today, Tomorrow & Beyond Levi Imbuzan, International Business (U)

136 10:00 am

Professional Skepticism in Auditing: The Challenge of Unconscious Biases **Fiona Jahn, Accounting (U)**

137 10:15 am

Time Scale Profile of Risk in Foreign Exchange Markets Jeremy Juybari, Economics and Interdisciplinary Studies (U)

Session A-8

Oral Presentation: Engineering & Computer Science OR1

Friday, March 3, 2017, 9:00 am

Location: Legacy Suite

138 9:00 am

Mass flux correlation with spread rate for downward flame spread over PMMA Blake Rhoades, Mechanical Engineering (M)

139 9:15 am

Design and Mechanical characterization of PI based MEA's Arvind Balasubramani, Mechanical Engineering (M)

140 9:30 am

Integration of Strain Sensors on Brain-Computer Interface Neural Probes Surabhi Nimbalkar, Bioengineering (M)

141 9:45 am

Microfluidic Platform for Separating Cancer Cell Clusters and Individual Cancer Cells from Whole Blood through Inertial Focusing and Patterned Microchannels

Manisha Phadke, Mechanical Engineering (M)

142 10:00 am

Production of Liposomes by Microfluidics for Investigating Single Molecule Reactions in Liposomes Yasna Behmardi, Bioengineering (M)

143 10:15 am

Microfluidic platform to create micro vortices to enhance the capture Cancer Stem Cells Shreyas Shah, Bioengineering (M)

Friday, March 3, 2017 Session B: Oral Presentations

Session B-1

Oral Presentation: Physical & Mathematical OR2 Friday, March 3, 2017, 11:00 am Location: Pride Suite

191 11:00 am

Mechanisms Affecting the Glass Transition Temperature of Thin Polystyrene Films Gerardo Mendoza, Astronomy (U)

192 11:15 am

Ab Initio Calculations of Rotating Medium-Mass Nuclei Miguel Godinez, Physics (U)

193 11:30 am Structure and Stability of Compact Stellar Twins Miguel Correa, Physics (U)

194 11:45 am

Ab Initio Calculations of Rotating Heavy Nuclei Dillon Adams, Physics (U)

195 12:00 pm

Quantum Kinetics and the Zeno Ansatz: Sterile Neutrino Dark Matter Produced in the Early Universe **Olexiy Dvornikov, Physics (M)**

196 12:15 pm

SubFlow: Modeling Geological Sequestration of Carbon Dioxide with Mimetic Discretization Methods Johnny Corbino, Computational Science (D)

Session B-2

Oral Presentation: Biological & Agricultural Sciences OR2 Friday, March 3, 2017, 11:00 am

Location: Park Boulevard

197 11:00 am

Characterizing Heterogeneous DNA Methylation in Mycobacterium tuberculosis Clinical Isolates with Single Molecule Real-Time (SMRT) Sequencing Samuel Modlin, Biological and Medical Informatics (M)

198 11:15 am

Computational Approaches to Explore the Correlation between Protein Structure and Thermal Stability **Aishani Chittoor Prem, Bioinformatics (M)**

199 11:30 am

Investigating the role of UPF3b in Pluripotent Stem Cells William Bray, Molecular Biology (M)

200 11:45 am

Kinetic investigation of human Polimerase epsilon Anna Uvarova, Chemistry (M)

201 12:00 pm

Bacterial minicells delay tumor progression and decrease colon inflammation in a mouse model of colon cancer Mengxi Tian, biology (M)

202 12:15 pm

The Impact of Estrogen on Anti-tumor Immunity in Prostate Cancer and its Role in the Racial Disparity Harmony Saunders, Cellular and Molecular Biology (M)

Session B-3

Oral Presentation: Behavioral & Social Sciences OR3 Friday, March 3, 2017, 11:00 am Location: Tehuanco

203 11:00 am

Towards Ultimate Gender Diversity in Advertising: A Communicative Attempt to Emancipate Advertising from the Gender Binary Sandra Wagner, Communication (M)

204 11:15 am

Creeping toward a model of "creepathy" Alanna McLeod, Communication (M)

205 11:30 am

Framing Electronic Toxins: A Content Analysis of South Korean E-cigarette Websites Taewook Ham, Communication (M)

206 11:45 am

I Sought It, I Reddit: An Exploratory Study of Reddit Users' Health Information Seeking Behaviors **Will Silberman, Communication (M)**

207 12:00 pm

Viral Trends: Understanding Media Use and Perceptions of the Zika Virus Joshua Santiago, Communication (M)

208 12:15 pm

Let's Get Digital: Student And Instructor Perceptions Of Digital Literacy And Web 2.0 Tools In Writing Classes Clarissa Dieck, Applied Anthropology (M)

Session B-4

Oral Presentation: Visual or Performing Arts OR1 Friday, March 3, 2017, 11:00 am Location: Aztlan

209 11:00 am

RISE UP: The Formation and Reimagining of American National Identity in Hamilton Susanna Vaughan, Musical Theatre (M)

210 11:15 am

Actor-Musicianship on the American Stage: An Evolving Theatrical Genre and How Theatre Educators Can Respond **Kathleen Banville, Musical Theatre (M)**

211 11:30 am

Western People Funny: A Brief Examination of the American Portrayal of the Siamese Culture in The King and I **Vinh Nguyen, MFA Musical Theatre (M)**

212 11:45 am

Gesamtkunstwerk and West Side Story Jonathan Brugioni, Master in Fine Arts in Musical Theatre (M)

213 12:00 pm

Musical Theatre Education Transformation: How to adapt American musical theatre education to build a solid B.F.A. curriculum in Taiwan **Yu-Ning Change, Musical Theatre (M)**

Session B-5

Oral Presentation: Biological & Agricultural Sciences OR3

Friday, March 3, 2017, 11:00 am

Location: Metztli

214 11:00 am

The potential of chicken-poop powered hydroponics: a creative method of utilizing nitrifying bacteria to convert chicken manure into useable nitrogen for crop plants **Chris Long, biology (U)**

215 11:15 am

The use of chemosensory cues by kangaroo rats in discriminating among snake predators Jessica Ryan, Biology (U)

216 11:30 am

Kangaroo rats change body temperature when investigating rattlesnakes Hannes Schraft, Ecology (D)

217 11:45 am

Types of floral visitation influence the composition of floral nectar microbial communities Megan Morris, Ecology (D)

218 12:00 pm

Microbial mediation of the decomposition of marine foundation species, Macrocystis pyrifera John Haggerty, Ecology (D)

219 12:15 pm

Remote Sensing of Wildfire - Examining the Environmental Controls of Fire Spread **William Brewer, Geography (D)**

Session B-6

Oral Presentation: Behavioral & Social Sciences OR4 Friday, March 3, 2017, 11:00 am Location: Templo Mayor

220 11:00 am

A Rough Road Home: Barriers to Accessing Treatment for Post Traumatic Stress Disorder in Former and Active Military **Darion Miller, Anthropology (U)**

221 11:15 am

Racial Differences in Motor Impairment Post-Stroke Neco Johnson, Psychology (U)

222 11:30 am

White matter compromise in autism spectrum disorder after careful group-matching for motion **Nicole Baggett**, **Psychology (U)**

223 11:45 pm

Restriction Spectrum Imaging of White Matter in Autism Spectrum Disorder Seraphina Solders, Biology & Psychology (U)

224 12:00 pm

Does More Equal Less: F-CBT Attendance on High-Risk Offender Recidivism Erica McDaniel, Social Work (M)

Session B-7

Oral Presentation: Humanities OR2 Friday, March 3, 2017, 11:00 am

Location: Visionary Suite

225 11:00 am

The Art and History of San Diego Presidio Ceramics circa 1820-1840 **Shawna Bishop, History (U)**

226 11:15 am

The Art and History of San Diego Presidio Ceramics circa 1820 - 1840 **Domenique Maj, History (U)**

227 11:30 am

The Art and History of San Diego Presidio Ceramics circa 1820-1840 **Erik Fredrickson, History (U)**

228 11:45 am

Replication and Research of 18th Century Puebla Pottery Jessica Van Ruiten, Applied Design (U)

229 12:00 pm

The Archaeology of San Diego Presidio Ceramics: 1820-1840 Cecelia Holm, Applied Anthropology (M)

Session B-8

Oral Presentation: Education OR1

Friday, March 3, 2017, 11:00 am

Location: Legacy Suite

230 11:00 am

San Diego State University Textbook Market Joseph Shapiro, Computer Science (U)

231 11:15 am

Perceived Faculty Support in Freshmen Year Boosts First-generation College Students' Belonging and Persistence in Science Garam Ann Lee, Psychology (M)

232 11:30 am

Reading outside the lines: Can prosocial utility value connections in science textbooks increase science engagement? Jeanette Zambrano, Psychology (M)

233 11:45 am

Kindergarten Students: Predictors of Teachers' Perceptions on Student Science Knowledge and Skills in Classrooms with English Learners **Melissa Navarro, Education (D)**

234 12:00 pm

Unraveling The Representations of a Transborder Cultural Identity for Transfronterizo College Students from the San Diego-Tijuana Border Region Vannessa Falcon, Higher Education (D)

235 12:15 pm

Closeness and Conflict: Teachers Perceptions of Kindergarten Girls Darielle Blevins, Education (D)

Friday, March 3, 2017 Session C: Oral Presentations

Session C-1

Oral Presentation: Behavioral & Social Sciences OR5 **Friday, March 3, 2017, 1:00 pm** Location: Pride Suite

287 1:00 pm

Exploring Immigrant and Refugee Women's Perceptions of Feminism, Women's Roles in Society, and Gender-Based Obstacles Marisa Meno, Social Science (U)

288 1:15 pm

Examining overlap among various forms of interpersonal violence: Results from the SDSU Sexual Violence Campus Climate Survey Wendy Avila, Psychology (U)

289 1:30 pm

Domestic Violence Against Women as it Relates to Human Rights **Elvina Rofael, Political Science (U)**

290 1:45 pm

The Dangling Conversation Matthew Baukol, History (M)

291 2:00 pm

Recounting, Resisting, and Reconfiguring: Transforming Women's Marginality Into Agency Through Art Jason Crane, Communication (M)

Session C-2

Oral Presentation: Education OR2

Friday, March 3, 2017, 1:00 pm

Location: Park Boulevard

292 1:00 pm

Transforming the Curriculum: Impact of High School Ethnic and Women's Studies Classes on Chicana/ Latina Students Celeste Rossbach, Social Science Single Subject and Women's Studies (double major) (U)

293 1:15 pm

Examining the Influence of Environmental Challenges on the Success of Men of Color in Community College Anthony Mota, Communication (U)

294 1:30 pm

Men of Color in the Community College and their Perceptions of Faculty Welcoming Their Engagement **Alejandro Arias, Foods & Nutrition (U)**

295 1:45 pm

Opening Communication and Bridging Knowledge: Increasing Involvement of Parents of Latino High School Students Angela Cerda, School Psychology (M)

296 2:00 pm

The Community College Experience of Southeast Asian Men from Community College to a Four-year University

Melissa Vang, PhD in Education (D)

297 2:15 pm

Worn Out: The effects of External Life Events on outcomes of success in the Community College Nexi Delgado, Educations (D)

Session C-3

Oral Presentation: Biological &

Agricultural Sciences OR4

Friday, March 3, 2017, 1:00 pm

Location: Tehuanco

298 1:00 pm

Pacing and ?1-Adrenergic Stimulation of Rat Ventricular Cardiomyocytes and Mouse Cardiac Stem Cell Viability Andy Fedoriouk, Chemistry/Biochemistry (U)

299 1:15 pm

Characterization of vaginal colonization by methicillin-resistant Staphylococcus aureus Liwen Deng, Biology (D)

300 1:30 pm

Effect of 2-Hydroxyglutarate on GOT1 Activity: How Oncogenic IDH1 Mutations May Alter Cysteine Metabolism in Gliomas Diego Avellaneda Matteo, Biochemistry (D)

301 1:45 pm

ATF6 Is Required for ANP Secretion from the Heart **Erik Blackwood, Cell and Molecular Biology (D)**

302 2:00 pm

Using the Planarian flatworm to investigate RING E3 ligase function in stem cell regulation and regeneration John Allen, Biology (D)

303 2:15 pm

Identification of Halomonas-like traits as a novel biomarker for Nodding Syndrome-like epilepsy Adrian Cantu, Computational Science (D)

Session C-4

Oral Presentation: Behavioral & Social Sciences OR6 Friday, March 3, 2017, 1:00 pm Location: Aztlan

304 1:00 pm

What Influences the Decision Making Process of Food Ordering for Children at Restaurants? Can this Affect How Much Children Eat When Dining Out? Jessica Cerda, Psychology (U)

305 1:15 pm

Overall and Externalizing Symptomatology in Young Maltreated Children: Exploring Ethnic Differences Berta (Erika) Luis Sanchez, Psychology (M)

306 1:30 pm

One Way In And One Way Out Llewelyn Labio, Communication (M)

307 1:45 pm

Neural Reactivity to Monetary Reward in the School-Age Offspring of Depressed Parents **Karen Schwartz, Psychology (D)**

Session C-5

Oral Presentation: Humanities OR3 Friday, March 3, 2017, 1:00 pm Location: Metztli

308 1:00 pm

The GenX Files: The Search for Masculinity in 1990s America Andrea Alvarado, History and English (U)

309 1:15 pm

Zines, Polyvocality, and Sound: How Modernist First-Wave Feminism Inspired Riot Grrrl **Riley Wilson, English (U)**

310 1:30 pm

The Interdependence of Women, Peace, and Security Leah Schroeder, International Security and Conflict Resolution (U)

311 1:45 pm

The Timeless Influence of Media in Political Campaigns Imani Hollie, Communication (U)

312 2:00 pm

#MyFather'sWhiteHood: Stormfront's Cyberspace Hate Speech and Ideological Community Formation Kendra Straub, Communication (M)

313 2:15 pm

Nostalgia is Death but Whose Death? Susan Shamoon, Children's Literature (M)

Session C-6

Oral Presentation: Interdisciplinary OR1

Friday, March 3, 2017, 1:00 pm

Location: Templo Mayor

314 1:00 pm

Post-fire hydro-geomorphic modeling after the 2012 Waldo Canyon Fire in Colorado Samira Nourbakhshbeidokhti, Civil Engineering (M)

315 1:15 pm

Language Dominance is Predictive of Cognate Effects and Inhibitory Control in Young Adult Bilinguals Jonathan Robinson Anthony, Language and Communicative Disorders (D)

316 1:30 pm

Ab initio calculations of Gamow-Teller transitions Jordan Fox, Computational Science (D)

317 1:45 pm

Where Two or More are Gathered; Faith Development Among Black College Students Jonei O'Bryant, Sociology; Minor in Counseling and Social Change (U)

318 2:00 pm

Regional Hypoperfusion and White Matter Tract Degradations among Elderly Patients with Amnestic and Nonamnestic Mild Cognitive Impairment **Evelyn Locano, Psychology (U)**

319 2:15 pm

Collaborative Efforts Towards Connectivity Conservation: A case study of the Yellowstone to Yukon Initiative Bridget Hicks, Geography (M)

Session C-7

Oral Presentation: Engineering & Computer Science OR2 Friday, March 3, 2017, 1:00 pm Location: Visionary Suite

320 1:00 pm

Penetrable Microelectrode Array In-Vitro Electrochemical Testing Alberto Perez Jr, Mechanical Engineering (U)

321 1:15 pm

Two Dimensional Heat Transfer Analysis Within Non-Thermally Thin Poly(Methyl Methacrylate) That is Burned in a Narrow Channel Apparatus **Nicholas Lage, Mechanical Engineering (M)**

322 1:30 pm

Numerical Simulation of Convective Cooling by a Wall Jet along a Convex Surface **Keyu Dhingani, Mechanical Engineering (M)**

323 1:45 pm

Optimized Solar Tower Receiver Philip Hoskinson, Mechanical Engineering (M)

324 2:00 pm

Integration and Testing of a Concentrated Full-Spectrum Optimized Photovoltaic Thermal Hybrid Solar Collector Naman Gupta, Mechanical Engineering (M)

325 2:15 pm

Inverse Identification of Damage in Composite Laminates using Electrical Resistance Tomography Paulina Diaz Montiel, Engineering Sciences (D)

Session C-8

Oral Presentation: Physical & Mathematical OR3

Friday, March 3, 2017, 1:00 pm

Location: Legacy Suite

326 1:00 pm

Monofonuctionalization of Pyrogallol[4]arene Cesar Garcia, Chemistry (U)

327 1:15 pm

Solar Fuel Conversion in the Hydrogen Evolution Reaction using a Novel Sulfide Catalyst Antonio Trammel, BioChemistry (M)

328 1:30 pm

Atroposelective Organocatalytic Nitroalkylation of Napthoquinones Ryan Noorbehesht, Organic Chemistry (M)

329 1:45 pm

Ruthenium Monoisomerization Catalyst: Studies in Selectivity Erik Paulson, Chemistry (D)

330 2:00 pm

Evaluating insertion kinetics of unnatural tC nucleotide into DNA using viral reverse transcriptase Marc Turner, Biochemistry (D)

331 2:15 pm

Nucleophilic Dynamic Kinetic Resolution of Atropisomeric Naphthoquinones Towards the Synthesis of Unique Chiral Scaffolds for Catalysis Sean Maddox, Organic Chemistry (D)

Friday, March 3, 2017 Session D: Oral Presentations

Session D-1

Oral Presentation: Humanities OR3 Friday, March 3, 2017, 3:00 pm Location: Pride Suite

384 3:00 pm

The Intersections of a Male Transborder Identity: The Experiences of Latino Men in the Community College Who Live Transborder Lifestyle in The San Diego-Tijuana, Mexico Region **Ulises Leal, Philosophy (U)**

385 3:15 pm

Philosophy: A Space of Exploration and Discovery Alec Wilkinson, Philosophy and Physics (U)

386 3:30 pm

Heidegger and the Postmodern Subject **Ricky DeSantis, Philosophy (U)**

387 3:45 pm

Cartesian Philosophy and Simulative Reality Ryan Stanford, Philosophy (U)

388 4:00 pm

Aesthetics: Dewey and Spinoza George Schieck, Philosophy (M)

389 4:15 pm

Mer-Made Machines: An Exploration of the Dual-Nature of Mermaids and Cyborgs Elizabeth Allison, Children's Literature (M)

Session D-2

Oral Presentation: Engineering & Computer Science OR3 Friday, March 3, 2017, 3:00 pm

Location: Park Boulevard

390 3:00 pm

A Stochastic Model for Predicting Cell Migration through a 3D Polymer Matrix Ben Yeoman, Bioengineering (M)

391 3:15 pm

Routing Protocol for Mobile Wireless Mesh Network of Multi-beam FDD Nodes Shreyas Devaraju, Electrical Engineering (M)

392 3:30 pm

The Effect of Multidirectional Bias Magnetic Fields on the Converse Magnetoelectric Response of Multiferroic Composite Ring Scott Newacheck, Bioengineering (M)

393 3:45 pm

Predictive Bone Remodeling Using In-Silico Simulations to Support Developments of Advanced Orthodontics Jose Gonzalez, Mechanical Engineering (M)

394 4:00 pm

Biologically-inspired fiber reinforced hydrogel composite: A mechanics-based study Nicholas Martin, Mechanical Engineering, Bioengineering (M)

395 4:15 pm

Effect of Extended Ultraviolet Exposure on the Mechanical Performance of Polyurea Elastomers Mohammed Atif Shaik, Mechanical Engineer (M)

Session D-3

Oral Presentation: Business, Economics & Public Administration OR2

Friday, March 3, 2017, 3:00 pm

Location: Tehuanco

396 3:00 pm

The impact of Design Thinking Francesco Chinaglia, Marketing (U)

397 3:15 pm

Entrepreneurs: The Inside Story Rosemary Blesio, Marketing (U)

398 3:30 pm

Easy Made Cosmetics Brian Ruthenberg, Marketing (U)

399 3:45 pm

Megachurches and Social Media Erick Pedraza, International Business (U)

Session D-4

Oral Presentation: Behavioral & Social Sciences OR7

Friday, March 3, 2017, 3:00 pm

Location: Aztlan

400 3:00 pm

English tense and agreement morpheme use in bilingual and monolingual speakers Sophia Kelly, Speech-Language Pathology: Specialization In Bilingualism (M)

401 3:15 pm

Effects of Iconicity on Cross-modal Translation Priming in Hearing Learners of American Sign Language and Deaf Native Signers: An ERP Study Megan Mott, Psychology (M)

402 3:30 pm

Language Variations in the Dominican Republic Adriana Moosekian, Spanish (M)

403 3:45 pm

Convergence and Divergence in the Predictions of Looking vs. Haptic Measures Erin Smolak, Language and Communicative Disorders (D)

404 4:00 pm

Phonological and semantic priming in American Sign Language: An ERP study Brittany Lee, Language and Communicative Disorders (D)

Session D-5

Oral Presentation: Biological & Agricultural Sciences OR5 Friday, March 3, 2017, 3:00 pm Location: Metztli

405 3:00 pm

A metatranscriptomic approach for characterizing host immune responses to bacterial virulence factors in the coral holobiont Saichetana Macherla, Bioinformatics and Medical Informatics (M)

406 3:15 pm

The effect of therapeutic VAX-IP minicells on the colonic microbiome in a CRC mouse model **Shea Grenier Davis, Molecular Biology (M)**

407 3:30 pm

Bioinformatics approach to analyze racial disparity in colorectal cancer using RNA-seq **Priyadarshini Mamindla, Bioinformatics and Medical Informatics (M)**

408 3:45 pm

Occurence of crAssphage in various metagenomes Sabrina Parlan, Bioinformatics and Medical Informatics (M)

409 4:00 pm

Optimization of microbiome assembly and binning within metagenomes Bhavya Nalagampalli Papudeshi, Bioinformatics and Medical Informatics (M)

410 4:15 pm

Using Read Mapping to Estimate the Abundance and Ubiquity of the Newly Discovered Bacteriophage, crAssphage, in Metagenomic Samples **Kyle Levi, Bioinformatics (M)**

Session D-6

Oral Presentation: Physical &

Mathematical OR2 Friday, March 3, 2017, 3:00 pm

Location: Templo Mayor

411 3:00 pm

Self-Assembly of Pyrogallol[4]arene Molecular Capsules in the Solid State Shaylyn Brim, Chemistry (U)

412 3:15 pm

Mucus Model Elena Arroyo, Physics (U)

413 3:30 pm

tCc – A New Family of Fluorescent Nucleosides Katrina Ngo, Chemistry (U)

414 3:45 pm

A Nucleophilic Atroposelective Kinetic Resolution (ANKR) Towards the Scalable Synthesis of Highly Selective Pyrrolopyrimidine Kinase Inhibitors Mariel Cardenas, Chemistry (Organic Chemistry) (M)

415 4:00 pm

Structural Optimization of Atropisomeric Pyrrolopyrimidine RET Kinase Inhibitors Sean Toenjes, Chemistry (D)

416 4:15 pm

The Catalytic Sulfenylation of Electron Rich Bio-Actives and FDA Approved Drug Christopher Nalbandian, Chemistry (D)

Session D-7

Oral Presentation: Visual or Performing Arts OR4 Friday, March 3, 2017, 3:00 pm Location: Visionary Suite

417 3:00 pm

Common Language of Arts Nhu Nguyen, Dance (U)

418 3:15 pm

Successful Scenic Design for Children's Theatre Victoria Vitola, Theatre Arts Design and Technology (M)

419 3:30 pm

Perception vs Entertainment Domonique Evans, Musical Theatre (M)

420 3:45 pm

Wearable Technology and Theatrical Story Telling Beatrice Collins, Costume Design and Technology (M)

421 4:00 pm

Fantasizing Homoeroticism in Naruto Live Spectacle (2015): Cross-gender Casting as Buffer for Male Homoerotic Tension in Stage Performance of Japanese Manga **Yi-Lin Chung, Theatre Arts (M)**

Session D-8

Oral Presentation: Behavioral & Social Sciences OR8 Friday, March 3, 2017, 3:00 pm Location: Legacy Suites

422 3:00 pm

Lay-perceptions of Happiness: A Cross-cultural Comparison between India and the United States Jessica Johnson, Psychology (U)

423 3:15 pm

Open Source Intelligence: Monitoring Violence in Tijuana through the News Andrew Hill, International Security and Conflict Resolution (U)

424 3:30 pm

The Connection of Insurgency Group's Participation in Drug Operations with Increased Violence as a Result of Greed: the Case of Colombia **Sarah Gruenewald, International Security and Conflict Resolution (U)**

425 3:45 pm

Difrasismo: Creativity and Metapoetic Space in Classical Náhuatl Metaphor Jose Renteria, Latin American Studies (M)

426 4:00 pm

Application of the Risk Environment Framework to Understand Prevalence and Correlates of Substance Use among HIV-Positive Latinos in the Tijuana-San Diego Region **Nicole Pepper, Interdisciplinary Research on Substance Use (D)**

Saturday, March 4, 2017 Session H: Oral Presentations

Session H-1

Oral Presentation: Interdisciplinary OR2 Saturday, March 4, 2017, 9:00 am

Location: Pride Suite

519 9:00 am

Spatial Language and Thought in Tseltal Mayan: New Evidence from a Transitive Inference Task **Dianna Hurtado, Psychology (U)**

520 9:15 am

Searching for High-Spin /Low-Spin Conic Intersections in Cyclic and Acyclic Organic Structures Harrison Pearce, Physics (U)

521 9:30 am

Methane Mitigation: Testing Immobilized Methylomicrobium alcaliphilum 20ZR Efficiency **Richard Hamilton, Biology (U)**

522 9:45 am

Exploring Academic Identity and Post-Graduation Anxiety Among College Students **Courtney Hook, Communication Studies (M)**

523 10:15 am

Hustlin' Campus Resources: Understanding Persistence among Men of Color in the Community College Bryan Osorio, Criminal Justice (U)

Session H-2

Oral Presentation: Health Nutrition & Clinical Sciences OR2

Saturday, March 4, 2017, 9:00 am

Location: Park Boulevard

524 9:00 am

Sensory Weighting of Posture: Implications for Fall Risk in Parkinson's Disease Mason Hearn, Kinesiology: Applied Movement Science (M)

525 9:15 am

Religiosity and Cardiovascular Disease Risk among Sexual Minorities: Results from a Nationally Representative Sample Kalina Lamb, Psychology (M)

526 9:30 am

Demographic and Treatment Factors that Influence Survival Among Hemangiopericytoma Patients Rolando Barajas, Epidemiology (M)

527 9:45 am

Evidence based Literature Review on early interventions for pregnant women to prevent caries in children Aarti Gupta, Public Health, Biometry (M)

Session H-3

Oral Presentation: Engineering & Computer Science OR4 **Saturday, March 4, 2017, 9:00 am** Location: Tehuanco

528 9:00 am

Comparison of Three Methods of Simulating Wind Flow over Large Computational Domains Brady Ells, Mechanical Engineering (M)

529 9:15 am

Assessing the potential of Fluorescence spectroscopy to track presence of contaminants in water reuse systems Joseph Wasswa, Environmental Engineering (M)

530 9:30 am

Driver Behavior Modeling for Curve Speed Warning (CSW) System Using Driving Simulator: Application of Vehicle-to-infrastructure (V2I) technology Alidad Ahmadi, Transportation Engineering (M)

531 9:45:00 am

An intragranular microfracture model for geologic sequestration of CO2 Jonathan Matthews, Computational Science (D)

532 10:00 am

Stream channel erosion in a rapidly urbanizing region of the US-Mexico Border: Documenting the importance of channel hardpoints with Structure-from-Motion **Kristine Taniguchi, Geography, (D)**

Session H-4

Oral Presentation: Behavioral & Social Sciences OR9

Saturday, March 4, 2017, 9:00 am Location: Aztlan

533 9:00 am

Influence of Residence on Alcohol Consumption in College Students **Courtney Patterson, Psychology (U)**

534 9:15 am

Comorbidity of Meth amphet amine Dependence and Human Immunodeficiency Virus Brianna Tawa, Psychology (U)

535 9:30 am

Moderators of Correlates of Sexual Compulsivity among Men who have Sex with Men: Results from a Meta-Analysis **Benj amin Rooney, Psychology (M)**

536 9:45 am

Correlates of Tanning Dependence amongst Sexual Minority Males Kelsey Nogg, Psychology (M)

537 10:00 am

Rates and Correlates of Syphilis Re-infection in Men who have Sex with Men in San Francisco Jennifer Jain, Interdisciplinary Research on Substance Use (D)

Session H-5

Oral Presentation: Humanities OR4 Saturday, March 4, 2017, 9:00 am Location: Metztli

538 9:00 am

Did Women Have an Axial Age? Gender and Cosmic Reciprocity Leah Gregory, History (M)

539 9:15 am

Recasting Jewish Magic: Female Responses To Changes in World History Samantha Young, History (M)

540 9:30 am

Sacred Women in Christianity and Buddhism: A Comparison of Mary, Avalokitesvara, and Guanyin from 300-900 CE Sarah Kemp, History (M)

541 9:45 am

"The Story Seems to Wear the St amp of Truth": Verisimilitude, Science Fiction, and H. Rider Haggard's She Anni Perheentupa Mackey, English (M)

542 10:00 am

Changing Narratives to Changing the Narrative S. L. Kay, History (M)

543 10:15 am

An Experiment in Gothic Writing: Considering the Donner Party as american Legend Rachel Greenberg, Creative Writing (M)

Session H-6

Oral Presentation: Behavioral & Social Sciences OR10 Saturday, March 4, 2017, 9:00 am Location: Templo Mayor

544 9:00 am

Second Wave Revisited: CA Feminist Policymaking by the First Assemblywomen of Color Nassim Moallem, Women's Studies (U)

545 9:15 am

Got Milk?: Investigating the Social Stigma Surrounding Breastfeeding Laura Horton, Communication (U)

546 9:30 am

Analysis of Traumatic Experiences Over Time Using the Massachusetts Youth Screening Instrument, Version 2 (MAYSI-2) Parker Hansen, Master of Social Work (M)

547 9:45 am

Does caregiver social support affect children's oral health? A systematic literature review Erin Dougherty, Public Health- Health Behavioral Sciences (D)

Saturday, March 4, 2017 Session I: Oral Presentations

Session I-1

Oral Presentation: Biological & Agricultural Sciences OR6 **Saturday, March 4, 2017, 11:00 am** Location: Pride Suite

548 11:00 am

Global and Local Studies of crAssphage: A Highly Abundant Phage Found Around the Globe Holly Norman, Microbiology- Public Health and Clinical Laboratory Science (U)

549 11:15 am

Forever young: Cranial growth in the gray whale (Eschrichtius robustus) based on ontogeny and phylogeny

Meghan Smallcomb, Evolutionary Biology (M)

550 11:30

Amphylogenetic inference of north american water mites in the subgenus micruracarus (genus arrenurus, family arrenuridae) utilizing morphological and molecular characters **Rachel Shoop, Evolutionary Biology (M)**

551 11:45 am

Shark biology regulates taxonomic composition while environment mediates the gene potential across microbiomes of three species **Michael Doane, Biology (D)**

552 12:00 pm

Lost in transition: developmental patterns of tooth formation and loss in fetal baleen whales and implications for mysticete evolution Agnese Lanzetti, Evolutionary Biology (D)

Session I-2

Oral Presentation: Behavioral & Social Sciences OR11 Saturday, March 4, 2017, 11:00 am Location: Park Boulevard

553 11:00 am

Pediatric Cannabis and the Barriers to Medicinal Use for Intractable Epilepsy **Tiyana Dorsey, Anthropology (U)**

554 11:15 am

The Effects of Prenatal Alcohol and Cannabinoid Exposure on Activity Level in a Rat Model Jena Gewarges, Psychology (U)

555 11:30 am

Risky Business: Evaluating the Causes and Conservation Implications of Bidirectional Interactions between Humans and Moor Macaques (Macaca maura) in South Sulawesi, Indonesia **Kristen Morrow, Anthropology (M)**

556 11:45 am

"Helping people...having them leave better than when they c ame in, even though I am totally ripping out their pubic hair:" Findings from The Sexual Health and Esthetician Study Emily Greenstadt, Public Health (M)

557 12:00 pm

Compensatory activation of the cognitive control network in heavy episodic drinkers: An fMRI study Sean M. Molnar, Psychology (M)

Session I-3

Oral Presentation: Engineering & Computer Sciences OR5 **Saturday, March 4, 2017, 11:00 am** Location: Tehuanco

558 11:00 am

Investigations on Dual Slant Polarized Cavity Backed Massive MIMO Antenna Panel with Beamforming Mohana V amshi Komandla, Electrical Engineering (M)

559 11:15 am

Investigations of Wideband Circular Polarized High Gain Microstrip Patch Array Antenna at Ku-band on Curved Surfaces Roshin Rose George, Electrical Engineering (M)

560 11:30 am

Electrical Characterization of Low-Profile Copper Foil for Reduced Surface Roughness Loss **Qianfei Su, Electrical Engineering (M)**

561 11:45 am

A Triple Mode Waveguide Corrugated Horn Antenna Using 3D Printing Technology Alejandro Castro, Electrical Engineer (M)

Session I-4

Oral Presentation: Behavioral & Social Sciences OR12 Saturday, March 4, 2017, 11:00 am Location: Aztlan

562 11:00 am

Implicit Associations about Hillary Clinton and Donald Trump: Who is more american, Competent, and Warm? Tawny Whaley, Psychology/Philosophy (U)

563 11:15 am

Influence of Emotional State on Reading Emotions Natalia Witkowska, Psychology (U)

564 11:30 am

Let's talk about secs: Gender differences in distracted driving. Hedaya Rizeq, Kinesiology, applied Movement Sciences (M)

565 11:45 am

Communicating Pain: How Gender Identity Influences Self-Disclosure and Pain Tolerance During the Cold Pressor Task **Chelsea Chapman, Communication (M)**

566 12:00 pm

Latina Mothers Speak: A Comparative Analysis of Motherhood Experiences in the Tijuana/ San Diego Border/lands Sarai Godoy, Chicana and Chicano Studies (M)



Poster Presentations

Friday, March 3, 2017 Sessions A, B, C, D and E

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



Friday, March 3, 2017 Session A: Poster Presentations

Session A-9

Poster: Behavioral & Social Sciences P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

144 9:00 am

Living with Thirdhand Smoke Toxicants: Do Smoking Policies Make a Difference? Samuel Padilla, Psychology (U)

145 9:00 am

The Toxicant Lurking in Your Walls: Thirdhand Smoke Accumulation in Low Income Housing **Taylor Shrum, Psychology (U)**

146 9:00 am

The additive association of indoor cigarette and marijuana smoking on potential exposure to fine particles Alexander Ivan Posis, Epidemiology (M)

147 9:00 am

The association between secondhand smoke and childhood asthma in the Respira Sano Study Janeth Juarez Padilla, Sociology (U)

148 9:00 am

Measurement of Levels of Nicotine, a Precursor of Toxic NDMA, in Source and Drinking Waters of San Diego by Triple Quadruple Mass Spectrometry **Brian Lim, Public Health (U)**

149 9:00 am

How Vocabulary Supports Lexical Processing in Young Bilinguals Lauren Thayer, Psychology (U)

Session A-10

Poster: Interdisciplinary P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

150 9:00 am

Methanotrophs in Desert Soils Jade Wong, Microbiology (U)

151 9:00 am

Cutting Down Greenhouse Pollutants: Biogas Utilization by Aerobic Methanotrohps Batool Youhenna, Cell and Molecular Biology (U)

152 9:00 am

Animal Literature Xinyi Zhang, Interdisciplinary Studies on Liberal Arts and Sciences (MALAS Program) (M)

153 9:00 am

A New Copper Catalyzed Method for Conjugate Additions to Unsaturated Carbonyls Paul Smith, Chemistry (M)

Session A-11

Poster: Engineering & Computer Science P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

154 9:00 am

Membrane Ultrafiltration For Water Treatment Anita Sanchez, environmental engineering (U)

155 9:00 am

Microbial Contributions to Organic Matter Optical Properties in Alvarado Creek During a Storm Event Lorelay Mendoza, Environmental Engineering (U)

156 9:00 am

Bench-Scale Evaluation of Solids Removal using Anaerobic Baffled Reactor **Theodore Mendoza**, **Environmental Engineering (U)**

157 9:00 am

Greener DEWATS: Duckweed as a Natural Polishing Step for Anaerobic Wastewater Treatment Plants Jesse Scolavino, Environmental Engineering (U)

158 9:00 am

Application of fluorescence spectroscopy to understand change in dissolved organic matter from wastewater treated in a bench scale anaerobic baffled reactor.

Chelsi Pascua, Environmental Engineering (U)

159 9:00 am

Analysis of ABR Hydraulics Daniel Parsons, Environmental Engineering (M)

Session A-12

Poster: Physical & Mathematical Sciences P1 Friday, March 3, 2017, 9:00 am

Location: Montezuma Hall

160 9:00 am

Theoretical evaluation of the C4H3 radical and its reactions with CO, HCN, O2, and C2H4 **Jade Johnson, Chemistry (U)**

161 9:00 am

Sensitive Detection and Separation of Nicotine and Cotinine by Laser Wave-Mixing Spectroscopy for Environmental and Biomedical Applications **Mya Brown, Chemistry (U)**

162 9:00 am

Sensitive and Selective Detection of Explosives by Nonlinear Optical Laser Wave-Mixing Spectroscopy Grant Varnau, Physics (U)

163 9:00 am

Application of Cation-Directed Catalysis Towards the Atroposelective Nucleophilic Kinetic Resolution of Promiscuous Pyrrolopyrimidine Kinase Inhibitors Joseph Mattocks, Chemistry (U)

164 9:00 am

The electrochemistry of 1-Ferrocenyl-3-Phenylurea (FcUHH) in the presence of the diamide guest, 1,4-dimethlpiperizine-2,3 dione (PZD) Megan Jackson, Biochemistry (U)

165 9:00 am

Fluorescence Sensing of Duplex DNA Formation by a Tricyclic Cytidine Analogue **Kristine Claudine Teppang, Biochemistry (U)**

Session A-13

Poster: Health Nutrition & Clinical Sciences P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

166 9:00 am

Imperial County Nurses Advancing Public Health Research in a Rural, Border Region **Gina Bonilla, Nursing (U)**

167 9:00 am

Empowering Nursing Confidence and Competence in CHF Patient Education Lauren Wren, Nursing (U)

168 9:00 am

Development of a Patient Navigation Intervention to Improve Colorectal Cancer Care **Tatianna Clark, Kinesiology (U)**

169 9:00 am

Minding the Gap: A Study on Nurse Empowerment & Intention to Leave Anna-Maria Cunningham, Nursing Leadership in Health Care Systems (M)

170 9:00 am

Differences in Sleep Deprivation among Undergraduate and Graduate Nursing Students Leslie Henricks, Nursing (M)

Session A-14

Poster: Behavioral & Social Sciences P2 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

171 9:00 am

The Neural Underpinnings of Word Learning Errors: School-Aged Children with Typical and Atypical Language Jasmine Guantez, SLHS (U)

172 9:00 am

The Relationship of Code-Switching and Translation Equivalents, and How Does It Relate to Executive Functioning in Young Children? Elizabeth Villanueva, Child and Family Development (U)

173 9:00 am

A Pilot Study of Compounding in Mexican Sign Language **Hari Buenfil, Linguistics (U)**

174 9:00 am

Using Microsoft KINECT to investigate the movement properties of signs in American Sign Language (ASL) **Ryan Edinger, Mechanical Engineering (U)**

175 9:00 am

Specific Purpose English Communication System for Seniors: A Follow-Up Study with Native Speakers of Somali Sim Quinzon, Speech-Language Pathology (M)

176 9:00 am

Voice Onset Time of Voiceless Plosives by English Monolingual Speakers Kiara Caber, Speech, Language, and Hearing Sciences (M)

Session A-15

Poster: Business, Economics & Public Administration P1 Friday, March 3, 2017, 9:00 am

Location: Montezuma Hall

177 9:00 am

Embodying Dance: how to build authentic marketers Martha Brosnan, Marketing and Dance (U)

178 9:00 am

Hortalizas Figueroa: Date Fruit Production and Distribution Analysis Ana Figueroaana, Marketing (U)

179 9:00 am

Is there a relationship between Job Satisfaction and Union Environments? Jeffrey Trageser, Nursing Leadership (M)

Session A-16

Poster: Engineering & Computer Science P2 Friday, March 3, 2017, 9:00 am

Location: Montezuma Hall

180 9:00 am

Optimal electrode selection for damage identification in Carbon Fiber Reinforced Polymer Composites using Electrical Resistance Tomography Luis Waldo Escalona-Galvis, Computational Science (D)

181 9:00 am

Evaluation of Vacuum Assisted Resin Injection Repair Protocol for Composite Materials Alexandra Mallory, Aerospace Engineering (U)

182 9:00 am

Electrode design for measuring circular delaminations using Electrical Resistance Tomography Adrian Rivera, Aerospace Engineering (U)

183 9:00 am

Predicting Degradation and Failure of Composites under Fatigue Loads Using a Micromechanics Model Lauren Parrett, Aerospace Engineering (M)

184 9:00 am

Implementation of Directional MAC Scheme for Multi-Beam Antennas in Riverbed Modeler Nandini Venkatraman, Electrical and computer engineering (M)

Session A-17

Poster: Health Nutrition & Clinical Sciences P2 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

185 9:00 am

Does maximal isokinetic power at exercise intolerance approximate critical power? Stanley Yong, Kinesiology (U)

186 9:00 am

Acute Effects of Sitting Interruption Modalities on Plasma Glucose in Postmenopausal Women **Sabrina Aden, Biology (U)**

187 9:00 am

The Effects of Feedback Type on Motor Learning of a Novel Swing Phase Trajectory Edgar Ramirez, Biology-Bioengineering (U)

188 9:00 am

Spine Motion Monitor: Validation of a device for daily monitoring of 3D lumbar spine posture and movement Katy Schneider, Kinesiology Pre-Physical Therapy (U)

189 9:00 am

Dynamics of locomotor fatigue during supra-critical power exercise in humans **Austin Swisher, Kinesiology (U)**

190 9:00 am

The Effect Of Moderate Intensity Stair Climbing On Postprandial Blood Glucose Tolerance Kathryn Ward, Exercise Physiology and Nutritional Science (M)

Friday, March 3, 2017 Session B: Poster Presentations

Session B-9

Poster: Behavioral & Social Sciences P3 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

236 10:45 am

Relations among Parenting Strategies, Contextual Variables, and Child Problem Behaviors within Foster Families **Daniel Barlam, Psychology (M)**

237 10:45 am

Child Behavioral Problems and Maternal Mental Health Kelly Gmeiner, Sociology (M)

238 10:45 am

Maximizing exposure therapy: An emphasis on self-efficacy Kylie Baer, Psychology (U)

239 10:45 am

Irritability as a Predictor of Depression Onset in At-Risk Adolescents Meghri Sarkissian, Psychology (U)

240 10:45 am

Parents' Mental Health and Engagement in Their Children's Mental Health Treatment **Pui Cheng, Child & Family Development (M)**

Session B-10

Poster: Physical & Mathematical Sciences P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

241 10:45 am

Metal-Mediated Dimerization of a Designed Protein-Protein Interface **Brian Maniaci, Chemistry (D)**

242 10:45 am

Modeling phage-bacteria dynamics in mucus: A multiscale approach to phage theraphy **Kevin Joiner, Computational Science (D)**

243 10:45 am

Coral - Algae Wars: How are invasive algae succeeding against coral? James Mullinix, Computational Science (D)

244 10:45 am

A Method of Energy Efficient Wireless Image Relay Unifying Application Content and Spatial Diversities **Shuan He, Computational Science (D)**

245 10:45 am

An Atroposelective Dynamic Kinetic Resolution of Di-Aryl Ether Naphthoquinones through Nitromethylation **Andrew Dinh, Chemistry (D)**

246 10:45 am

Quasi-Dynamical Symmetries in Ab Initio Beryllium Nuclei **Ryan Zbikowski, Computational Science (D)**

Session B-11

Poster: Biological & Agricultural Sciences P1 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

247 10:45 am

Developing strategies to target and kill cancer cells expressing the Wnt receptor FZD7 Tanisha Takhar, Cell and Molecular Biology (M)

248 10:45 am

Striding towards the generation of hippocampal like organoids Sarah Fernandes, Cell and Molecular Biology (M)

249 10:45 am

Development of skeletal muscle models of Emery-Dreifuss disease using human pluripotent stem cells Jesus Villanueva, Cell & Molecular Biology M.S. (M)

250 10:45 am

The cell surface adhesin BspC contributes to Group B Streptococcal meningitis Katilynne Vant Hul, Microbiology (M)

251 10:45 am

Effects of alcohol intoxication on spontaneous neural oscillations are modulated by dopamine availability as a function of COMT Val158Met genotype **William Brocklehurst, Master of Arts in Psychology (M)**
252 10:45 am

The use of signature genes and motifs as a way of annotating viruses to improve viral description **Dnyanada Pande, Bioinformatics and Medical Informatics (M)**

Session B-12

Poster: Health Nutrition & Clinical Sciences P3 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

253 10:45 am

The Effect of Green Tea Extract on Fat Oxidation During One Hour Arm Cycle Exercise Eric Bartholomae, Dual Masters - Exercise Physiology & Nutritional Science (M)

254 10:45 am

Locus of hunger and amygdala activation to a sweet taste in Hispanic young adults Jacquelyn Szajer, Clinical Psychology (D)

255 10:45 am

Aramchol as Treatment for HIV-associated nonalcoholic fatty liver disease and lipodystrophy Keagan Casey, Public Health (U)

256 10:45 am

Watermelon and Arginine Supplementation Alter Serum Lipid Profile, Inflammation, and Oxidative Stress in Rats by Regulating Gene Expression Joshua Beidler, Exercise Physiology and Nutritional Sciences (M)

257 10:45 am

Mixed nut consumption yields rapid improvement of lipid profiles, oxidative stress, and total antioxidant capacity in atherogenic-diet fed rats Shauna Groven, Nutritional Sciences (M)

258 10:45 am

The relationship between diet-related chronic disease diagnosis and fruit and vegetable consumption **Lorraine Pulido, Foods and Nutrition (U)**

Session B-13

Poster: Behavioral & Social Sciences P4 **Friday, March 3, 2017, 10:45 am** Location: Montezuma Hall

259 10:45 am

Leptin Levels in Middle Age Adults with Metabolic Syndrome Versus Middle Age Controls Ilex Beltran-Najera, Psychology (U)

260 10:45 am

Sensory abnormalities are linked to deficits in social communication in children with autism spectrum disorders Ellyn Pueschel, Psychology (U)

261 10:45 am

Atypical development of the corpus striatum in children and adolescents with autism spectrum disorder Sanjana Punyamurthula, Psychology (U)

262 10:45 am

Mortality and Olfactory Response Bias **Paul Wheeler, Psychology (M)**

263 10:45 am

Irritability and Amygdala-Ventral Prefrontal Cortex Connectivity in Children with High Functioning Autism Spectrum Disorder **Cynthia Kiefer, Psychology (M)**

264 10:45 am

Altered neural habituation to emotional faces in pediatric and adult bipolar disorder Maria Kryza-Lacombe, Clinical Psychology (D)

Session B-14

Poster: Interdisciplinary P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

265 10:45 am

The Kingdom of Cambodia: Political Corruption & Policy Effectiveness Kelsey Pickert, Communication (U)

266 10:45 am

Structural Bioinformatic Analysis of Phage Capsid Proteins as Environmental Indicator Dechao Zhu, Biochemistry (U)

267 10:45 am

A Total Chemical Synthesis of Micromide **Nicholas Hernandez, Biology (U)**

268 10:45 am

Kinetic Resolution of ?-Substituted Aldehydes via Vinylogous Mukaiyama Aldol Reaction **Brent Thomas, Chemistry (M)**

Session B-15

Poster: Biological & Agricultural Sciences P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

269 10:45 am

Identification of cell surface markers on Lung Progenitor Cells expressing NKX2-1 Rachael McVicar, Biology (U)

270 10:45 am

Modeling of Myotonic Dystrophy Type I With iPSC Derived Skeletal Muscle Stem Cells Alicia Razo, Biology (U)

271 10:45 am

Characterization of adult-like skeletal muscle differentiated from human pluripotent stem cells Joe Rodriguez, Biology - General (U)

272 10:45 am

Enhancement of Neuraxis Coverage of Multipotent Human Neural Stem Cells using Fucosylation and SDF-DV1 for in vivo Transplantation Studies Garland Jackson, Biochemistry (U)

273 10:45 am

An induced pluripotent stem cell (iPSC) model to study mechanisms of non-alcoholic fatty liver disease (NAFLD) associated with PNPLA3 polymorphisms in human hepatocytes **Itzel Navarrete, Biology with Emphasis in Cellular and Molecular Biology (U)**

274 10:45 am

Cryopreservation of Encapsulated Stem Cell Derived Pancreatic Beta-Cell Progenitors for the Treatment Of Diabetes. Julio Valle, Biology (U)

Session B-16

Poster: Engineering & Computer Science P3 Friday, March 3, 2017, 10:45AM Location: Montezuma Hall

275 10:45 am

The Effect of Inflow Cannula Length on the Intraventricular Flow Field of the Evaheart LVAD-assisted Heart Josue Campos, Mechanical Engineering/Bioengineering (U)

276 10:45 am

The Importance of Calcium Influx in Regards to Actin-Myosin Force Propagation **Brianna Manns, Mechanical Engineering (U)**

277 10:45 am

Motion and Respiration Rate Detection Using PIR Sensors Anna Reed, Computer Engineering (U)

278 10:45 am

The interaction of LV geometry, function, inflow cannula diameter, and LVAD support and its effect on the intraventricular flow field **Saniya Salim, Bioengineering (M)**

279 10:45 am

The Effect of Reverse Remodeling on Intraventricular Flow in the LVAD-Supported Heart Studied in a Mock Circulatory Loop **Ricardo Montes, Bioengineering/ Biomechanics (M)**

280 10:45 am

Left Ventricular Thromboembolic Risk in the LVAD-Assisted Heart Vi Vu, Mechanical and Aerospace Engineering (D)

Session B-17

Poster: Behavioral & Social Sciences P5 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

281 10:45 am

African American relationships and Hip Hop Kendra Boardingham, Psychology/TFM (U)

282 10:45 am

Crystalized Cognition in Children with Heavy Prenatal Alcohol Exposure **Rebecca Carvalho, Psychology (U)**

283 10:45 am

Effects of Moderate Ethanol Consumption on Gene Expression Involved in Lipid Metabolism and Inflammation in Rats Jeremy Pascua, Psychology (U)

284 10:45 am

Benefit Finding Examined in Various Pediatric Craniofacial Deformities **Michelle Faulkner, Psychology (U)**

285 10:45 am

The Effects of Age and Comorbidity on the Likelihood of Hiring a Health Care Advocate Among Traumatic Brain Injury Patients Lauren McKinley, Psychology (U)

286 10:45 am

Parental Dialogue on Sexual Health Topics: Implications on Sexual Risk Behaviors for STI and Unintended Pregnancy among Adolescent Girls at the US-Mexico Border Marissa Salazaar, Global Health (D)

Friday, March 3, 2017 Session C: Poster Presentations

Session C-9

Poster: Biological & Agricultural Sciences P3 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

332 12:30 pm

Preventing Proliferative ERK Activation following AKT-mTOR Inhibition in Head and Neck Squamous Cell Carcinomas (HNSCCs) Esteban Delgado, Biochemistry (U)

333 12:30 pm

IFN-? regulation of anti-tumor immunity in prostate cancer cell lines Marisela Martinez Arroyo, Bioengineering (U)

334 12:30 pm

H. pylori infection results in increased miR-21 expression in gastric primary and cancer cell lines **Martin Somo, Biology (U)**

335 12:30 pm

The impact of engineered bacterial minicells on tumor progression and inflammation in a mouse model of colon cancer Nairika Meshign, Biology (U)

336 12:30 pm

Anti-Human TNF treatment of a mouse model that overproduces TNF and develops ileitis and arthritis Jonathan Plascencia, Biology (U)

337 12:30 pm

Genetic Analyses of Mouse Repeats Important in Aggressive Colorectal Cancer Jennifer Luu, Biochemistry (U)

Session C-10

Poster: Behavioral & Social Sciences P6

Friday, March 3, 2017, 12:30 pm

Location: Montezuma Hall

338 12:30 pm

Electrophysiological effects of orthographic neighborhood in a letter detection task **Stephanie Osmond, Psychology (U)**

339 12:30 pm

Influence of linguistic, cognitive and musical skills on symbolic learning in monolinguals and bilinguals Claire Duffy, Speech, Language, and Hearing Sciences (U)

340 12:30 pm

ERP Effects of Orthographic Neighborhood in a Picture Typing Task **Teresa Roquet, Speech Language and Hearing Sciences (U)**

341 12:30 pm

Understanding Variability in Executive Function Skill in Toddlers Kelly Kortright, Psychology (U)

342 12:30 pm

The Influence of College Major on Emotional Intelligence Hannah Scheierman, Psychology (U)

Session C-11

Poster: Engineering & Computer Sciences P4 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

343 12:30 pm

Convert any car into a Smart Driverless Car Shivam Garg, Electrical Engineering (M)

344 12:30 pm

Vehicular Communication System Preetham Rajkumar, Electrical Engineering (M)

345 12:30 pm

Analysing Kernel-Level and User-Level Code Performance in OS for Efficient IoT Implementation Chinmay Prabhudesai, Electrical Engineering (M)

346 12:30 pm

Design of Four Elements MIMO Antenna for Tablet Size Ground Plane with Reconfigurable Lower Band and Consistent High Band Anthony Wang, Electrical Engineering (M)

347 12:30 pm

A Dual Polarization Massive MIMO Panel Array Antennas at 2.4 GHz with Beamforming Capability. Sandhya Krishna, Electrical Engineering (M)

348 12:30 pm

W-Band Feed Horn with Polarizer Structure for an Offset Reflector Antenna for CubeSat Applications **Ghanshyam Mishra, Electrical and Computer Engineering (D)**

Session C-12

Poster: Physical & Mathematical P3 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

349 12:30 pm

Measuring Metal Complexation Capacity of Unknown Fulvic Acid Substances via Capillary Electrophoresis **Rebecca Townsley, Chemistry (U)**

350 12:30 pm

Advancing Blood Doping Detection **Jessica Torres, Chemistry (U)**

351 12:30 pm

Optimization Of Spectrometric Analysis Of Doping In Commercial Nutritional Supplements Through Liquid Phase Extraction Adam Perez, Chemistry (U)

352 12:30 pm

The Characterization of the Receptor Tyrosine Kinase Tie2 Madison Kennedy, Biochemistry (U)

353 12:30 pm

Establishing structure-function relationships of isocitrate dehydrogenase 1 (IDH1) mutations identified in cancer Stacy Anselmo, Chemistry with an Emphasis in Biochemistry (U)

354 12:30 pm

Kinetic Characterization of Isocitrate Dehydrogenase 1 (IDH1) Mutations Identified in Tumors **Precious Moman, Biology (U)**

Session C13

Poster: Behavioral & Social Sciences P7 Friday, March 3, 2017, 12:30 pm

Location: Montezuma Hall

355 12:30 pm

Factors Influencing Pregnancy Intentions and Contraceptive Use Among Adolescent Girls in San Diego County: A Qualitative Exploration Sara Kidman, Health Science-Public Health (U)

356 12:30 pm

Perceptions of Black Women Due to Their Hairstyles and Textures Ashley Zollicoffer, Psychology (U)

357 12:30 pm

Racial- Gendered Policing Angelica Tharpe, Pre Psychology (U)

358 12:30 pm

The Physiological Distress of Widowed Men Arely Sanchez, Sociology (M)

359 12:30 pm

Experiences of Cultural Brokering in Latino Young Adults **Stephanie Nguyen, Child Development (M)**

360 12:30 pm

Gender Differences in the Provision of Injection I nitiation Assistance Among People Who Inject Drugs in Tijuana, Mexico Stephanie Meyers, Interdisciplinary Research on Substance Use (D)

Session C-14

Poster: Biological & Agricultural Sciences P4 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

361 12:30 pm

Cis-regulatory Analysis of the Ascidian Pou4 Gene Tiffany Hoang, Biology (U)

362 12:30 pm

Molecular Evolution and Expression of Defense Genes Underlying Plant Carnivory Zachary Johnston, Biology (U)

363 12:30 pm

Analyzing the effect of crAssphage sequences on the FOCUS profiling output Emma Billings, Biology (U)

364 12:30 pm

Gap-filling metabolic networks using k-mer distance evidence Taylor O'Connell, Bioinformatics and Medical Informatics (M)

365 12:30 pm

Characterizing Metagenomes Using K-mer Abundance Beverly Hom, Bioinformatics and Medical Informatics (M)

366 12:30 pm

Metabolic model and data-driven exploration linking genotypes to phenotypes Daniel Cuevas, Computational Science (D)

Session C-15

Poster: Health Nutrition & Clinical Sciences P4 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

367 12:30 pm

Evidence Based Sports Biomechanics Program Noah Ingram, Kinesiology- Pre Physical Therapy (U)

368 12:30 pm

Ethnic differences in pain sensitivity and associations with psychological health Paige Kettenburg, Kinesiology Pre-Physical Therapy (U)

369 12:30 pm

Overground Ambulation Using an Exoskeleton with Variable Assistance for Individuals with Incomplete Spinal Cord Injury

Carla Baxter, Doctor of Physical Therapy (D)

370 12:30 pm

The Impact of Hip Strengthening on Pelvic Floor Function: A Novel Rehabilitation Approach **Taylor Autry, Doctorate of Physical Therapy (D)**

371 12:30 pm

Postpartum Diastasis Recti Abdominis: Treatment and Functional Implications Jennifer Fasching, Doctor of Physical Therapy (D)

372 12:30 pm

Effects of Over Ground Bionic Ambulation Training on Walking Function and Health in People with Incomplete Spinal Cord Injury: A Case Series **Rowena Tam, Doctor of Physical Therapy (D)**

Session C-16

Poster: Engineering & Computer Sciences P5 **Friday, March 3, 2017, 12:30 pm** Location: Montezuma Hall

373 12:30 pm

Deriving field-based streamflow and stream-power in Alvarado Creek in San Diego, California Sheikha Al-Rahbi, Civil Engineering (U)

374 12:30 pm

Cell mechanics: how mechanical properties effect malignant transformation and homeostatic pressure in cells Kasia Siedlecki, Mechanical Engineering, Bioengineering Emphasis (U)

375 12:30 pm

Algal cell disruption using copper ethanolamine to enhance lipid extraction **Cintia Chin, Environmental Engineering (M)**

376 12:30 pm

Stochastic Variations in Cellular Mechanical Properties Modeled in Tumor Growth **Zibah Mirzakhel, Bioengineering (M)**

377 12:30 pm

Anaerobic digestion of lipid extracted algae Ramin Eskandarzadeh Yazdi, Mechanical and Aerospace (D)

Session C-17

Poster: Behavioral & Social Sciences P8 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

378 12:30 pm

El Caso de los Desechables: Hacia la Transformación Socio-jurídica del migrante (The disposables ones: the path to socio-legal transformation for irregular migrants) **Derick Abrigu, Latin American Studies and Public Administration (M)**

379 12:30 pm

Pediatric Cannabis: Parents creating answers where there aren't any Gabriella Kueber, Psychology (U)

380 12:30 pm

The Digital Divide Ian Larson, Sociology (M)

381 12:30 pm

Positive and Negative Effects of Reverse Culture Shock Jeremy Schonberg, Psychology and Criminal Justice (U)

382 12:30 pm

College Student Stress Correlates with the Source of Financial Assistance Morgan Marvin, Psychology (U)

383 12:30 pm

Poverty Awareness Among Social Work Students Amir Moradi, Social Work (U)

Friday, March 3, 2017 Session D: Poster Presentations

Session D-9

Poster: Behavioral & Social Sciences P9 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

427 2:15 pm

Relationship between Job Satisfaction and Bullying at a Multinational Level Julie Ton-Vuong, Psychology (U)

428 2:15 pm

Moderators of the Relationship between Coworker Gender Similarity and Job Satisfaction Joyce Hwang, Industrial and Organizational Psychology (M)

429 2:15 pm

The Interaction of Sexual Orientation and Race in Predicting Men's Income **Thuan Nguyen, Sociology (M)**

430 2:15 pm

The Effects of Supervisor Behavior on Individual Workplace Outcomes: A Multilevel Exploration of Personal and Contextual Mediators **Noelle Devlin,** Industrial and Organizational Psychology (M)

431 2:15 pm

Predictors of followers' preferences for authoritarian leadership Saige Riley, Industrial and Organizational Psychology (M)

Session D-10

Poster: Physical & Mathematical P4 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

432 2:15 pm

Synthesis and Structural Characterization of Spider Silk Mini Spidroin Peptide Mimics Mahsa Pahlavanneshan, Chemistry (M)

433 2:15 pm

Modeling the Transition Between Lytic and Lysogenic Behavior in a Bacteria-Phage System **Emily Jasien, Applied Mathematics (M)**

434 2:15 pm

A Bayesian Approach to Multiple Testing of Equality in Binary Data for Crossover Trials **Subashini Sudarsan, Public Health- Biometry (M)**

435 2:15 pm

Effect of Added Bases on the Redox-Responsive Dimerization of a 4 H-Bond Array containing a Phenylenediamine Redox Couple **Katrina Vuong, Chemistry (M)**

436 2:15 pm

A Total Chemical Synthesis of Micromide **Nicholas Hernandez, Biology (U)**

437 2:15 pm

Surface Waves over Arbitrary Vorticity Profiles Robert Insley, Computational Science (D)

Session D-11

Poster: Engineering & Computer Science P6 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

438 2:15 pm

Flapping Unmanned Aerial Systems Enrico Santarpia, Aerospace Engineering (D)

439 2:15 pm

San Diego State University Water Tunnel Carlos Mendoza, Aerospace Engineering (U)

440 2:15 pm

Impact of Internal Forced Air Cooling on Radiative Absorption of a Gas-Particle Medium in a Small Particle Solar Receiver James O'Hara, Mechanical Engineering (M)

441 2:15 pm

An experimental evaluation of a solar simulator and solar receiver **Robert Newcomb, Mechanical Engineering (M)**

442 2:15 pm

Flames... out of this world Luca Carmignani, Mechanical and Aerospace Engineering (D)

443 2:15 pm

A Frequency Channel Allocation Algorithm for Creating a Network of Wireless FDD Nodes **Moein Parsinia, Computational Science (D)**

Session D-12

Poster: Behavioral & Social Sciences P10 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

444 2:15 pm

The Insidious and Elusive Nature of the Adoption and Safe Families Act and Its Impact on Black Mothers Zakkiyya West, Political Science and Africana Studies (U)

445 2:15 pm

Monkeys in our Backyard: Developing effective signage to encourage a positive human-monkey interface in Florida **Bridget Rickman, Sustainability (U)**

446 2:15 pm

Roadside monkeys: The impact of provisioning on moor macaque (Macaca maura) ranging patterns in Bantimurung-Bulusaraung National Park, Sulawesi, Indonesia Joshua Trinidad, Biology, Emphasis on Zoology (U)

447 2:15 pm

Incarceration Effects on Social Mobility **Denise Hernandez, Sociology (M)**

448 2:15 pm

Examining burials from two Formative Period communities within the lower Rio Verde Valley, Oaxaca **Aaron Young, Anthropology (M)**

Session D-13

Poster: Biological & Agricultural Sciences P5 Friday, March 3, 2017, 2:15 pm

Location: Montezuma Hall

449 2:15 pm

The Effect of Habitat Restoration on the Diversity and Abundance of Insect Pollinators **Kristi Baker, Biology, Emphasis in Ecology (U)**

450 2:15 pm

Plant Community Composition Determines Sediment Ammonium Levels In Two Southern California Salt Marshes Wendi White, Biology (U)

451 2:15 pm

The Impact of Climate Change on Pollinator Communities and Flowering Plants Lauren Lopez, Biology (U)

452 2:15 pm

Using metagenomics to characterize floral visitation-driven metabolic signatures of nectar microbes **Natalie Frixione, Biology (U)**

453 2:15 pm

Phylogeny of the Teiid Genus Aspidoscelis Steven Byrum, Biology (U)

454 2:15 pm

Comparison of Survey Data for Owl Population in the Imperial County Abigain Quintero, Mathematics as a Single Subject Teaching (U)

Session D-14

Poster: Behavioral & Social Sciences P11 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

455 2:15 pm

How Vocabulary Supports Lexical Processing in Young Bilinguals Lauren Thayer, Psychology (U)

456 2:15 pm

Translation Equivalents and Code-Switching in Bilingual Preschoolers Alyssa Campos, Speech Language and Hearing Sciences (U)

457 2:15 pm

The Influence of Repeated Exposure on Word Recognition Chanel Konja, Speech Language and Hearing Sciences (U)

458 2:15 pm

Time-course of lexical activation of verbs during sentence processing Valeria Garcia, Speech Language and Hearing Sciences (U)

459 2:15 pm

Acquisition of Complex Clusters in L2 Phonology Makayla Davis, Speech Language Pathology (M)

Session D-15

Poster: Engineering & Computer Science P7 Friday, March 3, 2017, 2:15 pm

Location: Montezuma Hall

460 2:15 pm

Fluorescence approach to determining photochemical degradation rates of oil in seawater Madeleine McConnell, Mechanical Engineering (U)

461 2:15 pm

Understanding the impacts of vegetation on post-fire evapotranspiration in the San Bernardino Mountains, California. Fahmy Attar, Environmental Engineering (U)

462 2:15 pm

Role of Clay Content on the Strength of Polymer-Bound Sand Tasneem Sadeque, Civil Engineering (U)

463 2:15 pm

Evaluating changes to snow-covered area after forest fires in the Pacific Northwest Phillip Patague, Civil Engineering (M)

464 2:15 pm

Effect of burn severity on dissolve organic carbon levels in disturbed watersheds after the Roblar Fire **Auvid Mirhosseini, Civil Engineering (M)**

465 2:15 pm

Spatial and temporal evapotranspiration patterns following wildfires in semi-arid regions of United States **Patrick Poon, Civil Engineering, Water Resources (M)**

Session D-16

Poster: Behavioral & Social Sciences P12 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

466 2:15 pm

Patient, provider and system level factors to consider when implementing evidence based CRC cancer prevention & early detection in a FQHC Jasmine Carey, Interdisciplinary Studies (U)

467 2:15 pm

Cultural Beliefs and Contextual Factors Affecting Cancer Treatment Choices at the US-Mexico Border Marisabel Coronado, Psychology (U)

468 2:15 pm

Pathways to Care for Latina/o Children with Cancer in Rural and Small Communities at the Border Jorge Cisneros, Psychology (U)

469 2:15 pm

Gender Roles, Social Relationships, and Health: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study **Kinsey Pebley, Psychology (M)**

470 2:15 pm

Understanding the Experiences of Cancer Diagnosis and Coping: Perspectives of Rural Latino Cancer Patients on the USA-Mexico Border. Anastasia Beloshapko, Social Work (M)

471 2:15 pm

Health Locus of Control Beliefs and Cancer Fatalism in the Deaf Community Marcelo Nieto, Public Health (M)

Friday, March 3, 2017 Session E: Poster Presentations

Session E-1

Poster: Engineering & Computer Science P8 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

472 4:00 pm

A Novel Water And Energy Saving Strategy – The Use Of Secondary Effluent For Algal Biomass Cultivation Daniel Delgado, Environmental Engineering (U)

473 4:00 pm

Hydrologic Modeling of Alvarado Creek using HEC-HMS Kyler Stevenson, Environmental Engineering (U)

474 4:00 pm

Understanding the Impacts of Restoration on Channel Hydrology, Morphology, and Vegetation on Alvarado Creek using Time Lapse Photography **Michael Violante, Environmental Engineering (U)**

475 4:00 pm

Using Remote Sensing Data to Analyze Regional Water Budgets and Crop Productivity Kelly Flint, Environmental Engineering (U)

476 4:00 pm

Are Environmentally Friendly Buildings Always More Costly? Target Value Design Applied to Sustainable Construction Samia Silveira, Civil Engineering (M)

477 4:00 pm

Potential Opportunities for Water Conservation in the Imperial Valley, California Using METRIC EEFlux Evapotranspiration and Landsat NDVI **Maegan Salinas, Geography (M)**

Session E-2

Poster: Biological & Agricultural Sciences P6 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

478 4:00 pm

Antibiotic Effect on Immune System Nelissa Figueroa, Microbiology, Emphasis in Clinical Lab Science (U)

479 4:00 pm

Inhibition of the Ampicillin Resistance gene by Antisense RNA **Netaliya Zora, Biology (U)**

480 4:00 pm

Developing a Reliable Read-Out of TLR7 Activation Charles Vallez, Cell and Molecular Biology (U)

481 4:00 pm

SoxSession B1-2 expression is essential for the specification and maintenance of sensory neurons in planarians

Karla Gonzalez, Biology (U)

482 4:00 pm

Calcium fluxes modeled in cultured neonatal ventricular cardiomyocytes Noor Atto, Biochemistry (U)

483 4:00 pm

Targeting of CD98 by the E3 Ubiquitin Ligase MARCH1 Susana Najera, Cell and Molecular Biology and Spanish (U)

Session E-3

Poster: Physical & Mathematical P5 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

484 4:00 pm

Analyzing the Electrochemical Trend of Benzoquinone Being Titrated in Unbuffered Aqueous Solution Ilan Sobel, Chemistry (U)

485 4:00 pm

A Method to Assemble Larger Supramolecular Structures Through Radical Pi Stacking Interactions Using Viologens Joquel Vasquez, Biochemistry (U)

486 4:00 pm

Novel Detection of Biomarkers Highly sensitive detection methods are required to diagnose diseases and monitor treatment progress using biomarkers. Our of Pancreatic Cancer Using Nonlinear Multi-Photon Laser Detectors Interfaced to Separation Techniques **Jie Liang, Chemistry (M)**

487 4:00 pm

Sensitive Analysis of Multiple Sclerosis Biomarker Using Nonlinear Multi-Photon Laser Wave-Mixing Spectroscopy Filippo Venturini, Chemistry (M)

488 4:00 pm

Ultrasensitive Detection of Cancer Biomarker CEA Using Nonlinear Degenerate Four-Wave Mixing Spectroscopy James Suprapto, Chemistry (M)

Session E-4

Poster: Education P1

Friday, March 3, 2017, 4:00 pm

Location: Montezuma Hall

489 4:00 pm

The Impact of Native-Language Literacy Interventions on Bilingual Reading Fluency Jenna Palacios, School Psychology (M)

490 4:00 pm

Simulating Poverty to Develop Awareness and Empathy in Educators Brian Thammavong, Social Work (M)

491 4:00 pm

Addressing Student Social-Emotional Needs in High-Performing Schools Nancy Nguyen, Sociology (U)

492 4:00 pm

Investigating the Effect of Supplemental Instruction on Underrepresented Minority Students Xiela Ross Edusada, Public Health (U)

Session E-5

Poster: Behavioral & Social Sciences P13 Friday, March 3, 2017, 4:00 pm

Location: Montezuma Hall

493 4:00 pm

Differential Effects of Age on Recall and Recognition Discriminability in Men and Women Meghan Ursa, Psychology (U)

494 4:00 pm

Spatial Recognition Memory Across the Adult Lifespan: Evidence for Age-Related Deficits in Spatial Pattern Separation in Middle and Old Age **Shannon Yandall DeJesus, Psychology (U)**

495 4:00 pm

The Role of Gender in Odor Tasks Aimed at Predicting Alzheimer's Disease Jeremea Songco, Psychology (U)

496 4:00 pm

Potential Differential Variability of Inflammatory Blood Biomarkers as a Function of Age **Sarah Gough, Psychology (U)**

497 4:00 pm

Older Adults Prioritize Cognitive Tasks Above Balance Control when Engaged in a Dual Task Sergio Olvera, Psychology (U)

498 4:00 pm

Nighttime Blood Pressure Dipping is Negatively Associated with Age in Healthy Adults Stephanie Coffin, Kinesiology, Pre-Physical Therapy (U)

Session E-6

Poster: Biological & Agricultural Sciences P7 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

499 4:00 pm

"Hole" Genome Sequencing: Illumina Blind Spots in Mycobacterium tuberculosis Genome **Tal Shmaya, Bioinformatics (M)**

500 4:00 pm

Intersection of Genotype and Phenotype: Informing Predictive Models Rebecca de Wardt, Cell and Molecular Biology (M)

501 4:00 pm

The Effects of Manipulating Expression of Thin, Oxen, Hsp23, and Hsp60 on Muscle Structure and Function in Wild-Type and Inclusion Body Myopathy-3 Muscle **Kimberley Manalo, Cell and Molecular Biology (M)**

502 4:00 pm

Annotating the M. Tuberculosis Hypotheticome: Updating Gene Annotations with Unspecific or Absent Products via Literature Review Alyssa Zlotnicki, Bioinformatics and Medical Informatics (M)

503 4:00 pm

Regional patterns in coral reef microbial community structure Douglas Naliboff, Molecular and Cell Biology (M)

504 4:00 pm

Phenotypic analysis of 20 marine Vibrio spp. isolated from kelp forests offshore San Diego, California **Tucker Lopez, Environmental Health (M)**

Session E-7

Poster: Behavioral & Social Sciences P14

Friday, March 3, 2017, 4:00 pm

Location: Montezuma Hall

505 4:00 pm

Autonomic Indices of Emotional Responsivity in Binge Drinkers Morgan Slauter, Psychology (U)

506 4:00 pm

High-intensity (binge) drinking is associated with altered neural oscillations in young adults **Rifqi Affan, Psychology (U)**

507 4:00 pm

Choline as a Treatment for Fetal Alcohol Spectrum Disorders: Effects on Hippocampal Brain-Derived Neurotrophic Factor **Kim Potter, Psychology (M)**

508 4:00 pm

An Analysis of Sociodemographic and Clinical Differences Among Civilians, Active Duty and Veterans in a Driving Under the Influence (DUI) Sample Jennifer Head, Social Work (M)

509 4:00 pm

Spanish and English Speaking Latino Emergency Department Patients: Alcohol Use Characteristics and Effects of Brief Intervention Fabian M. Martinez, Social Work Administration/ Healthcare Management & Policy (M)

510 4:00 pm

The relationship between self-perceptions of alcohol intoxication and breath alcohol concentration (BrAC) **Natasia Courchesne, Joint Doctoral Program in Interdisciplinary Research on Substance Use (D)**

569 4:00 pm

Development of a photocatalyst-light activating layer hybrid structure for the evolution of hydrogen gas. Nicholas Williams, Chemistry, (Masters)



Abstracts of Presentations

Session A



Session A-1

Oral Presentation: Health Nutrition & Clinical Sciences OR1 Friday, March 3, 2017, 9:00 am Location: Pride Suite

100 9:00 am

Understanding the Relationship Between Physician Referral Practices and Timeliness of Care in Patients with Colorectal Cancer Cheri Morgan, Public Health (U)

Background: Colorectal Cancer (CRC) is the second leading cause of cancer related deaths in the United States. The diagnosis and treatment of colorectal cancer is a complex process involving specialists from multiple disciplines. The purpose of this study is to examine the relationship between physician referral practices and the timely delivery of care.

Patients and Methods: A qualitative exploratory study was performed using the SEER-Medicare database. Patients were selected based on the diagnosis of cancer located either in the colon or the rectum. Analysis was focused on referral relationships between physicians. These physician dyads were then analyzed as to the time between referral to specialist and delivery of care. These two relationships were analyzed to answer if a strong referral relationship between providers was reflected in timely delivery of care to the patient leading to better clinical outcomes for patients with colorectal cancer.

Results: Preliminary results indicate that the SEER-Medicare data supports the significance of provider dyads when factors regarding timeliness of care and patient outcomes are analyzed.

Discussion Using the SEER-Medicare database we could focus on the relationship between primary care physicians and specialists in the treatment of patients with colorectal cancer. We examined the time interval between diagnosis and delivery of care. The interconnectedness of services is crucial for positive clinical outcomes.

9:15 am 101

Association Between Physical Activity and Mechanical Pain Sensitivity

Jaime Zinn, Kinesiology Pre-Physical Therapy (U)

Although routine engagement in physical activity is recommended for the prevention and management of chronic pain, the effect of habitual physical activity on pain sensitivity is not known. Existing studies have compared pain sensitivity outcomes between athlete and non-athlete groups categorized based on subjective report of physical activity levels. Thus, it is not known to what extent pain sensitivity varies with objectively measured differences in habitual physical activity and sedentary behavior in the general population. Hypothesis: More time spent engaged in physical activity will be associated with lower

sensitivity to mechanical pain. Methods: Healthy young (age = 21.5 (2.2) years) adults with no history of chronic pain wore a triaxial accelerometer (ActiGraph Model wGT3X-BT) on the waist while performing their usual activities for 7 consecutive days. Published calibration equations were used to classify each 1-min epoch of data as sedentary behavior (SB, <100 cpm), light intensity physical activity (LPA), and moderate-to-vigorous intensity physical activity (MVPA). The amount of time spent in each category was expressed as a percentage of total daily wear-time, and was averaged across days with at least 10 hours of valid data. Mechanical pain sensitivity was quantified by applying a 1-cm2 rubber-tip algometer to the ventral forearm at a rate of 50 kPa/sec. Pressure pain threshold (PPThr) was recorded as the pressure at which the stimulus first became painful, and pressure pain tolerance (PPTol) was recorded as the pressure above which the painful sensation could no longer be tolerated. Associations between physical activity and pain sensitivity outcomes were assessed with Pearson's correlation. Results: On average, 74(SD 6)% of total daily wear time was spent engaged in SB. LPA and MVPA comprised 23(5)% and 4(2)% of daily wear time, respectively. PPThr ranged from 34 to 287 kPa, and PPTol ranged from 536 to 1576 kPa. PPThr was not associated with physical activity outcomes. PPToI was negatively associated with SB (r = -0.60), and positively associated with LPA (r = 0.56) but not MVPA. Conclusion: Healthy young adults who engage in less sedentary behavior and more light intensity physical activity have greater tolerance of mechanical pain. Future work should determine whether this relationship reflects activity-related adaptations in pain processing, or the effects of pain tolerance on willingness to engage in physical activities.

102 9:30 am

Understanding the Relationship Between Language Accessibility, Discharge Instructions and Hospital Readmission Fathiya Abdi, Public Health (U)

Background: The United States spends by far the most on healthcare than any other developed nation; approximately billion of dollars are spent on readmission. As our nation becomes more diverse demographically so does the patient population in terms of languages and cultures. Some patients do not speak English and experience significant

miscommunication, as a result barriers exist at the hospital. The purpose of this study is to explore the relationship between culturally competent care processes (intake, patient education, diagnosis) and readmission rates. The main variables explored were language, readmission, discharge and intake. Methods: The study is a cross-sectional analysis using the 'Cultural Competency Assessment Tool for Hospitals, a survey of 31 questions to measure the cultural and language competency of California and Florida hospitals merged with data from the American Hospital Association for hospital structural variables. The sample consisted of 183 hospitals that responded to the survey from a population of 575. Descriptive and Anova analysis were performed to assess relationships. Results

indicated that there is no significance at the structural level (> than p-value of .05). We noticed that the services chosen for patients at the process level were significant (< than p-value). For example hospital services of identifying cultural and language needs of in-patients at the admission of screening, was found to be significant (<.0001) and hospitals considering cultural and language needs during the discharge planning was also significant (<.0002). Conclusion: Our preliminary findings suggest incorporating cultural competent practices into hospital processes and services can be an important and beneficial strategy for hospitals. More research into understanding how and what services and delivery avenues is necessary to ensure quality and equitable services for all patients.

103 9:45 am

Is There a Relationship Between Edentulism and Quality of Life?

Daisy Lopez, Public Health (U)

Purpose: The purpose of this study is to examine the association between being edentulous (complete loss of all natural teeth), and Oral Health-Related Quality of Life (OHQoL).

Methods: Surveys were collected in Summer 2015 as part of an oral health needs assessment of a large convenience sample of 257 community-dwelling, English-speaking older adults 60 and older at the Gary and Mary West Senior Wellness Center.

OHQoL was measured using Slade's validated 14-item Oral Health Impact Profile (OHIP-14) questionnaire. OHIP-14 assesses the impact of oral health problems across different dimensions (functional limitation, physical pain, psychological discomfort, physical disability, social disability, and handicap).

In this cross-sectional analysis, being edentulous was the main outcome of interest. Descriptive statistics were computed in SPSS. A logistic regression model examined the association between being edentulous and OHQoL dimensions, accounting for socio demographics, health behaviors, and other covariates.

Results: Among the 257 seniors, 65 (25%) were edentulous and 192 (75%) were dentate. The average age was 69.39 years (\pm 6.99) and the sample was 38% female. There were no differences in overall OHQoL scores, but edentulous seniors had worse (higher) functional limitation subscale scores than those with teeth (1.50 vs. 1.07, p=0.012). They reported more trouble pronouncing words and also worsened sense of taste due to problems with their teeth, mouth or dentures.

In the logistic regression model, seniors with a worse OHQoL-functional limitation score were 1.45 times more likely to be edentulous compared to their counterparts (95% Confidence Interval [CI] =1.12-1.88, p<0.01). Seniors that visited a dentist within the last year were less likely to be edentulous compared to those without a recent dental visit (Odds Ratio [OR]=0.38, CI=0.19-0.76, p<.001). If seniors self-reported they needed dental treatment, they were 5.24 times more likely to be edentulous compared to seniors without treatment needs (CI=2.38-11.57, p<.001).

Conclusion: Edentulous seniors experienced functional limitations and reported worse OHQoL than seniors with teeth. Perceived dental needs was positively associated with edentulism, while recent dental utilization was negatively associated with edentulism. This suggests that edentulous seniors have unmet dental needs.

104 10:00 am

Phenolic Content and Antioxidant Activities of Red and Green Sichuan Peppers Mary Ann Marroquin, Foods & Nutrition (U)

Red (Zanthoxylum simulans) and green (Z.schinifolium) Sichuan peppers are widely used as spices in Asian countries. Their phytochemical compositions and antioxidant activities have not been thoroughly investigated. This study was to characterize the phenolic content and antioxidant activities of the red and green Sichuan peppers. Dried red and green Sichuan pepper fruits were ground using a cryogenic mill. Phenolic compounds were extracted in absolute ethanol (flour-to-solvent ratio = 1:10 w/v) by continuous vortex mixing at room temperature for 1 hour. Total phenolics, total flavonoids, ferrous ion chelating activity, ferric reducing power, and ABTS radical scavenging activity of the extracted phytochemicals were analyzed, using gallic acid, catechin, EDTA, ascorbic acid, and Trolox as the standards, respectively. One-way ANOVA was performed to compare means for significant difference. Post hoc analysis was performed using Fisher's least significant difference test at p≤0.05. Total phenolics per gram of red and green Sichuan peppers were 25.1 ± 1.5 and 19.4 ± 0.9 mg gallic acid equivalent, respectively. The total flavonoids per gram of red and green Sichuan peppers were 15.9 ± 0.7 and 8.7 ± 3.3 mg catechin equivalent, respectively. One gram of red and green Sichuan peppers had ferrous ion chelating activities equivalent to 6.0 ± 0.4 mg and 4.4 ± 0.6 mg EDTA. respectively. The ferric reducing powers of red and green Sichuan peppers were 25.1 \pm 0.5 and 17.8 \pm 0.9 mg ascorbic acid equivalent per gram, respectively. The ABTS radical scavenging activity for red and green Sichuan peppers was 18.9 ± 0.6 and 15.2 ± 0.4 mg Trolox equivalent per gram, respectively. Overall, the red Sichuan pepper had significantly higher phenolic content and antioxidant activities than green Sichuan pepper (p≤0.05). The abundance of antioxidants suggested potential applications of Sichuan peppers in foods to increase antioxidant activities. The flavonoids and other phenolic compounds may play important roles in the overall antioxidant activities of the Sichuan peppers, which can benefit the nutraceutical, manufacturing, and general health industries.

Session A-2

Oral Presentation: Behavioral & Social Sciences OR1 Friday, March 3, 2017, 9:00 am Location: Park Boulevard

105 9:00 am

Ambivalent Supervision: Negative Outcomes and Cross-Domain Buffers Riley Johnson, Psychology (U)

Ambivalent supervision is an understudied concept within industrial organizational psychology. In this thesis, ambivalent supervision is defined as subordinate experiences of both positive and negative treatment by their supervisor. Adverse consequences of negative leadership styles, like abusive supervision, are intensified when coupled with supervisor support, making the relationship between simultaneous abuse and support significant to study. This research investigated perceived organizational, peer, and family support as potential moderators of the relationship between ambivalent supervision and organizational commitment, psychological well-being, and employee trust in the supervisor. Non-leader sources of support (perceived organizational, peer, and family) were chosen as moderators based on the cross-domain stress-buffering hypothesis, which states that social support buffers the effects of social conflict when the support originates from a different source than the conflict. A total of 283 undergraduate students at San Diego State University participated in a web-based survey about their experiences at work. Participants completed measures of ambivalent supervision, affective organizational commitment, stress, perceived health, affective supervisor trust, peer support, perceived organizational support, family support, and level of interaction with their supervisor. Results were analyzed using moderated and multiple regression analyses in SPSS. Preliminary results indicate that ambivalent supervision was significantly related to employee stress, affective organizational commitment, and employee trust in their supervisor. Additionally, there was evidence that the relationship between ambivalent supervision and stress was moderated by peer support, such that the presence of peer support buffered the negative consequences of ambivalent supervision with regard to employee stress. Based on these results, organizations should take action against ambivalent supervisors in order to protect employees and to increase levels of employee retention. Additionally, organizations could promote peer support through increased staff bonding opportunities to help prevent ambivalent supervisors from negatively affecting subordinate stress and well-being.

106 9:15 am

Grown-Ups at Play: Disneybound & Fan Performance at Disneyland Mar-Kell Law, Communication (M)

Disneybounding is a new trend is spreading throughout Disney theme parks in North America. Adult visitors semiotically pair shirts, bottoms, and accessories together in outfits that hint at Disney characters, rides, themed areas, and even Disney food. Disnevbounding is fan performance and pseudo-cosplay that originated in response to Disney's regulations prohibiting adults wearing costumes at the parks. The goal of this study was to examine Disneybounding at Disneyland as a performative act of fan expression. The researcher combined previous experiences of interactions with Disneybounding with ten hours of field observation at Disnevland Resort in California, interviews with five self-described Disneybounders, and analyzed three weeks of fan activity on a Facebook group page dedicated to Disneybounding. Findings from this ethnography position Disneybounding as a community within the Disney fandom, as a manifestation of the struggle between producer and consumer, and as a negotiation between adolescence and maturity. The study also contributes to the literature on Fandom studies, on Performance studies, and offers insight into visitor behaviors at theme parks.

107 9:30 am

Measuring Personality-Performance Relationships: A Person-Centered Approach

Caitlin Jacobson, Industrial/Organizational Psychology (M)

Although empirical research demonstrates that personality predicts a significant amount of variance in work performance, these findings are not without criticism. Studies using personality predictors are often criticized for having low criterion-related validities. A possible reason for the low validity may be that personality dimensions are traditionally conceptualized as independent, competing predictors (the variable-centered approach). However, this view does not take into account that individuals vary on multiple personality traits that exist concurrently (the person-centered approach). It is expected that combining traits together could mitigate criticisms over single personality traits' smaller effect sizes when predicting work performance. The present study speaks to calls in the literature to combine Big Five personality traits into personality types" or profiles. The results will be used in a comparison to address the debate over whether the variable-centered approach or person-centered approach provides better predictions. Previous research also suggests that focusing on specific dimensions of work performance could enhance the validity of personality-performance relationships. The present study will take this into account by examining task, citizenship, and adaptive performance dimensions. Employee engagement, absence, and lateness will also be examined as work outcomes. The present study incorporates data from two different samples. Participants for study 1 are 181 train operators employed by a large Transit Authority. Participants

for study 2 are being recruited using Amazon Mechanical Turk (MTurk). These participants must be at least 25 years of age, currently employed, and reside in the United States. Analyses will first investigate primary personality trait influences through correlations. Personality profiles will subsequently be created using latent profile analysis and compared to work outcomes using three-step mixture modeling. The analyses along with implications for organizations will be discussed during the session.

108 9:45 am

The Opportunity Cost of Love: Couples Negotiating Perceptions of Alignment in the Workplace

Torey Romero, Communication (M)

Couples who work together struggle with maintaining the perception of their relationship in the workplace. This research was conducted using a gualitative method in order to explore how couples negotiate and attempt to influence the perception others have of them and how they use communication to do so. This process is called alignment negotiation and is a form of impression management that couples utilize when maintaining the impressions others have of their relationship. Few studies have focused on the experiences of couples who share the same workplace. This study was motivated by an interest in understanding how the intersection of different identities is negotiated in different institutions. Participants were interviewed in person and by skype, totaling twelve participants in all. Patterns that emerged from the data that was collected resulted in the three dimensions of alignment negotiation: negotiating spillage; negotiating uncoupling; and negotiating censoring.

109 10:00 am

Structural Empowerment in Nursing Groups: A Dominance Analysis Approach Dustin Abbott, Applied Psychology Industrial-Organizational) (M)

Empowering employees has been shown to lead to several important outcomes in organizations. Structural empowerment, or the organization's formal tools to promote a sense of empowerment in employees, is a workgroup-level, multidimensional construct which includes access to information, access to resources, opportunity for advancement, and organizational support. It has been found to be positively related to desirable outcomes such as job performance, organizational commitment, and psychological empowerment, and negatively related to absenteeism and turnover intentions.

Frequently, a question arises with multidimensional measures: which dimensions are most important for the outcomes of interest? This question can be answered by conducting a dominance analysis. A dominance analysis assesses the relative importance of predictors in a regression model. This approach compares pairs of predictors to all possible subsets of other predictors in the regression model, which allows the researcher to establish two types of dominance: general and conditional. General dominance is established when one predictor contributes more to the variance explained, on average, across all possible models than another predictor. Conditional dominance is established when one predictor contributes more to the variance explained in a particular model than another predictor.

The present study endeavors to explore general and conditional dominance of structural empowerment dimensions in a nursing context using three critical outcome variables. Two dominance analyses will be conducted at the workgroup level. The first will regress adverse events on the four dimensions of structural empowerment. The second will regress teamwork on the four structural empowerment dimensions. The third dominance analysis will be a cross-level analysis in which individual-level psychological empowerment will be regressed on the four structural empowerment dimensions.

Data for this study comes from an archival dataset from 3,059 registered nurses nested in 239 workgroups in 21 hospitals across Ontario, Canada. Ninety-five percent of participants were female with an average age of 42.22 years (SD=10.19) and average organizational tenure of 16.82 years (SD=10.88). Nurses reported average workgroup tenure of 8.13 years (SD=7.82). The average group size is 12.79 nurses. The results of the dominance analysis and the implications for organizations will be discussed in the presentation.

Session A-3

Oral Presentation: Physical & Mathematical OR1 Friday, March 3, 2017 9:00 am Location: Tehuanco

110 9:00 am

Q-plates with Quarter Wavelength Retardance Isaiah Abella, Physics (U)

By sending a laser beam through a q-plate, we can create a bizarre polarization pattern, which may have uses in encoding information for optical communications. While q-plates with a half wavelength phase retardance have been studied, other retardance values have been nearly untouched. This research focuses on studying and mapping the properties of q-plates with a phase retardance of a quarter wavelength. Two methods are used to obtain this special q-plate. The first method utilizes a liquid crystal device to create a segmented quarter wavelength q-plate. In the second method, a q-plate manufactured to operate at the half wavelength retardance of a helium-neon laser is instead placed in front of an argon-ion laser. In both cases, the polarizing properties of the quarter wavelength q-plate are studied by sending polarized light through the plate and imaging the results through an analyzer. The experimental results obtained through these methods match the results of Jones matrix analysis and computer simulations.

111 9:15 am

Vector Beam Polarization State Spectrum Analyzer Joseph Holland, Physics - Modern Optics (U)

As optical fibers, waveguides, and line of sight communications have become more popular we explore new and exotic polarization states to fit more channels into them and increase their throughput. A proof of concept for a Vector Beam Polarization State Spectrum Analyzer is presented. At the heart of this system is a phase only spatial light modulator which serves as a two dimensional grating. A combination of a polarization diffraction grating, which generates six channels with basic polarization states (linear at 0,45,90,135 degrees and Right and Left circularly) in the vertical direction, and an encoded harmonic q-plate grating which generates six different channels with vortex or topological charges from -3 to +3 (excluding 0) in the horizontal direction. A g-plate is an optical element similar to a half wave retarder (HWP) except its optical axis rotates azimuthally so the vortex or topological charge represents the integer ratio of rotations of the optical axis to spatial rotations about the center of the plate. The combined grating generates the 36 permutations of those channels so that the topological charge and polarization state of an input vector beam can be determined simultaneously.

112 9:30 am

Constant-Q Filter Banks for Identifying Odontocete Whistles

Bryan Tran, Computer Science (M)

Conventional spectrum analyzers utilize filter banks with equally spaced center frequencies and bandwidths. Frequency modulated signals, such as whistles produced by toothed whales, are better measured with spectrum analyzers whose filter banks exhibit bandwidths proportional to their center frequencies. In other words, the quality (Q) factor of these filters is constant, and a spectrum analyzer using such filters is called a constant-Q analyzer. We present an implementation of a discrete Fourier transform (DFT) based constant-Q analyzer. The input signal is preprocessed with a number of half-band and band-pass filters, as well as 2-to-1 and 4-to-1 downsampling stages. Such preprocessing reduces workload, and prepares each frequency octave for DFT processing. A sliding frequency window of variable bandwidth applied to the DFT spectrum allows estimation of arbitrary center frequencies with arbitrary resolutions. Spectral estimations with center frequencies and bandwidths coincident with the center frequencies and bandwidths of a desired proportional filter bank are then taken. We show the results of this system on a set of recordings of toothed whale whistles.

113 9:45 am

Empirical Wavelet Frames for Signal Processing Antonio Silveti-Falls, Applied Mathematics (M)

In all branches of science, one is able to learn a great deal about a given system by studying the signals associated with it. In the 1980's, the seminal work of Meyer and Daubechies demonstrated the effectiveness of wavelet frames to analyze signals in the time-frequency plane with "painless nonorthogonal expansions". However, this work considered families of wavelets which tiled the time-frequency plane in a uniform, predetermined structure involving translations and dilations of a mother wavelet. Furthermore, the mother wavelet under consideration was assumed to have compact support, limiting the applicability of the results somewhat.

In this presentation, we discuss a nonuniform tiling of the time-frequency plane which is adapted to the signal being analyzed. To accomplish this, we introduce so called empirical wavelet frames which are families of functions formed by applying modulation, translation, and dilation operators to a mother wavelet. It was shown by Dennis Gabor in 1946 that the gaussian function is the unique minimizer of the Gabor-Heisenberg uncertainty principle. For this reason, we consider empirical wavelet frames for which the mother wavelet is the normalized gaussian function, which does not have compact support. To deal with the technical issues that arise from a mother wavelet with noncompact support, we employ the recently developed idea of approximately dual frames.

114 10:00 am

PETSc Based Parallelization of the Fully 3d-curvilinear Non-hydrostatic Coastal Ocean Dynamics model, GCCOM Manuel Valera, Computational Science (D)

Nearshore and stratified water physics phenomena have created a need for high-resolution coastal ocean modelling to accurately calculate hydrodynamic processes. Coastal Ocean models are computationally demanding due to multi-scale physics, non-hydrostatic pressure solving, and in our model, a fully 3D-curvilinear geometry. In this project, we present advances and strategies of integrating the Portable Extensible Toolkit for Scientific Computing (PETSc) library to existing serial code, which provides the MPI parallel framework to the General Curvilinear Coastal Ocean Model (GCCOM). We begin with the non-hydrostatic pressure solver where the serial model spends over 65% of its time. After incorporating PETSc in this solver, preliminary timing results show the model's potential in strong scaling. This prompts the parallelization of the entire GCCOM to improve overall performance. Recent developments that allow GCCOM to be a more robust application are also presented.

115 10:15 am

Enhancement of Silicon Solar Cells via the Attachment of Silver Nanoparticles Martha Zepeda Torres, Physical Chemistry (D)

Silver nanoparticles have been a research topic for several years now due to their strong surface plasmon resonance and antimicrobial capabilities. These properties are the basis of many applications such as plasmon-enhanced solar cell enhancement, Surface-enhanced Raman Spectroscopy and medical devices with sterilized surfaces. The purpose of this project is to enhance the efficiency of solar cells, specifically in the infrared (IR) region of the solar spectrum, by chemically attaching silver nanoparticles to solar cell surfaces.

The first step was to synthesize silver nanoparticles that absorb light in the infrared region. This was accomplished by reducing silver nitrate with sodium borohydride in the presence of trisodium citrate as the capping agent. Hydrogen peroxide was added to the solution, as a means of limiting the size and shape of the silver nanoparticles. The importance of having silver nanoparticles that absorb near-IR region is to capture the energy that is not captured by the solar cells. The next step was to attach a linker molecule to the solar cell, which was initially done using silicon wafers as the trial material. The attachment was done by immersing the wafers into a solution of linker molecule and exposing the system to ultraviolet light. The linker molecule used for this project was allylamine, which has a terminal double bond essential to binding to the surface and a terminal amine group to bind to the silver nanoparticles. Once the process was proven to work, it was duplicated but this time using solar cells. The final step was to attach the near-IR silver nanoparticles to the linker molecule.

Currently we are testing the enhancement factor of the modified silicon solar cells with the silver nanoparticles. Results of these experiments, as well as for others involving different linker molecules, will be presented.

Session A-4

Oral Presentation: Biological & Agricultural Sciences OR1 Friday, March 3, 2017, 9:00 am Location: Aztlan

116 9:00 am

A Hydroponic Study of the Effects of UV Transmittance on Nutrient Dense Vegetables Allison Rinehart, Environmental Science (U)

We conducted a hydroponic study of three different nutrient-dense vegetables, taking both quantitative and qualitative measurements. The vegetables we used in this experiment [Basil (Purple Petra), Broccoli (Purple Sprouting), and Lettuce (Red Sails)], were chosen for their naturally occurring high antioxidant levels, and for their ability to sustain themselves in a hydroponic environment. Our methods involved constructing two 4'x8' hydroponic nutrient beds, one covered with a UV transmitting film and the other with a Non-UV transmitting film. The primary focus of our study was to test if increasing the amount of UV radiation would increase the total amount of antioxidants present and improve the overall taste of the vegetables. Initial results appear to confirm this hypothesis. Lettuce and basil samples that we grew were analyzed by one of our advising professors, Changgi Liu. The samples were ground in absolute ethanol, centrifuged and the supernatants were collected for analysis. Total phenolics (Singleton and Rossi 1965), total flavonoids (Jia and others 1999), ferrous ion chelating activity (Carter 1971), ferric reducing power (Oyaizu 1986), and 2,2'-azino-bis (3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) radical scavenging activity (Re and others 1999) of the samples were analyzed, using gallic acid, catechin, ethylenediaminetetraacetic acid (EDTA), ascorbic acid, and Trolox as the standards, respectively. One-way analysis of variance (ANOVA) and Fisher's least significant difference post hoc test (p≤0.05) were used to evaluate the phenolic content and antioxidant activities. For the lettuce samples, the results agreed with our hypothesis because the lettuce that received more exposure to the UV light had higher antioxidant activities. The basil samples exposed to higher levels of UV radiation displayed decreased levels of antioxidants, and therefore rejected our hypothesis. The small sample sizes and immaturity of the basil heads may explain this rejection. The broccoli samples were not viable enough for the antioxidant test. Given the rapid growth in greenhouse vegetable production, this experiment can make important recommendations for maximizing nutrient density a key priority of sustainable agriculture.

117 9:15 am

Correlation Between Precipitation, Water Quality, and Detection of Phage-Encoded Shiga Toxin Gene Along San Diego Coast Tess Condeff, Biology (U)

Beaches along San Diego's coastline are commonly closed after rain due to sewage contamination from Mexico's Tijuana River and urban runoff. The human pathogen, Escherichia coli, carries the phage-encoded shiga toxin gene (stx) and is commonly found in human and animal waste. Phages are viruses of bacteria that can carry virulence genes such as stx. The transfer of toxin genes to bacteria could lead to the evolution of novel human pathogens. With an increased risk of exposure to waste-associated pathogens like E. coli after it rains, it becomes important to monitor impacted environments for phage-encoded toxin genes. We were interested in investigating temporal and spatial changes of stx levels in contamination-affected areas along the San Diego Coast following a rain event. Sediment and water samples from highly contaminated waterways along the Southern US/ Mexico border of San Diego County to less contaminated beaches along the northern coast were collected during and following a period of heavy rain and screened, via molecular

NBSTRACTS

assays, for stx. Temperature, pH, nitrate and phosphate levels, and total bacterial and coliform counts were measured to assess water quality and determine if there was any correlation between water quality and presence/frequency of the stx gene. The stx gene was detected in 40% of all samples and was detected most frequently in samples collected from the highly sewage-impacted Tijuana River Estuary near the US/ Mexico border. Nitrate and phosphate levels were also highest at this location. The data indicates an increased presence of phage-encoded stx in the highly sewage-impacted area along the southern border and is correlated to water quality in terms of bacterial and nutrient levels.

118 9:30 am

Elucidation of UNC-45 Function Using FRET Abdallah Ashour, Biology (U)

Mechanisms of muscular dystrophy and many cardiac muscle diseases are still not well understood. Focusing on specific proteins and their roles in muscle function is crucial to understanding these diseases and devising combat strategies. An example of such a protein is the molecular motor, myosin, which plays a major role in muscle contraction. Any protein that interacts with myosin could potentially alter myosin function and influence muscle performance. The focus of this study is UNC-45, which is a protein chaperone that interacts with myosin to protect it from damage or stress. We used the UNC-45 crystal structure to predict its mechanism of function. We hypothesize that when UNC-45 translocases out of the Z-disc (where it is stored) to the A-band (where the myosin is), it changes its conformation from a V shape to more linearized form. To confirm the hypothesis, FRET will be used to indirectly correlate UNC-45 structure to its location. The presence of a FRET signal will indicate that the UNC-45 protein is in the compact, V-shaped structure, whereas the lack of a FRET signal will suggest that the UNC-45 protein is in the extended, linear conformation. To initiate this project, The first goal is to create a gene encoding UNC-45 with a cyan fluorescent protein (CFP) and a yellow fluorescent protein (YFP) at its N- and C- termini, respectively. The In-Fusion technique will be employed to construct the plasmid which will then be injected into Drosophila embryos to make transgenic flies. These flies will then allow us to observe the FRET signal and extrapolate the structure of UNC-45 to its function. This work will clarify the importance of the UNC-45 protein in regulating myosin function and may yield insights into muscle diseases and potential therapies.

119 9:45 am

Defects in Skeletal Muscle Function Associated With Expression of Human Myosin Dilated Cardiomyopathy Mutations in Drosophila Hassler Rengifo, General Biology (U)

Dilated cardiomyopathy(DCM) is a serious human disease that involves decreased heart pumping ability. The mechanism by which myosin DCM mutations cause cardiac impairment is not understood. Drosophila is a highly tractable model in which

approximately 75% of human disease genes are conserved. Drosophila can serve as a useful screening tool to define mutations that are causative of the disease in humans. The S532P and R369Q mutations, residing in the actin binding sites, were previously introduced into Drosophila to investigate if myosin DCM mutations impair muscle function. My first goal was to validate already existing transgenic fly lines for expression of mutant myosin in indirect flight muscles (IFMs). These lines were previously crossed into a Mhc10 myosin null background in IFMs. SDS-PAGE was employed to verify that protein levels were close to wild-type in IFMs. RT-PCR was employed to verify that the lines had RNA encoding for mutant myosin and for the absence of wild-type myosin and alternative splicing defects. My second goal is to determine if these mutations cause a progressive decline in flight ability of homozygotes compared to wild-type transgenic controls. Since the mutations studied are located within highly-conserved actin binding regions of myosin likely crucial for muscle function, we hypothesize that their expression will impair flight ability in Drosophila. Preliminary results indicate progressive disruptions in flight ability of S532P homozygotes, suggesting reduced muscle function. Ultimately, we will examine the biochemical basis of the mutant phenotypes. We predict that the mutations impair muscle function, likely by disrupting actin binding.

120 10:00 am

Influence of the Potential Therapeutic VAX-IP on Colorectal Tumor Growth Savannah Sawaged, Biology (U)

Colorectal cancer develops from abnormal cell growth in the large intestine that matures into malignant tumors. These tumors are characterized by inflammation which is driven mainly by immune mediators that are involved in signal transduction and help regulate inflammatory responses. In larger tumors immune marker levels change, indicating a correlation with tumor size and number. We examine specific correlations between immune markers with anti-tumor and pro-tumor promoting properties and colorectal tumor development to help us further understand how cancer suppresses the immune system. We use a FABP Cre/APC fl-468 mouse model of colon cancer with a conditional deletion of the 11th and 12th exons of the APC gene that mimics human disease. These mice form colonic lesions around 15 weeks of age and may develop polyps that can rapidly proliferate to form invasive tumors.

Mice were treated 6 times in different age groups before and after tumor development. Parental mice were used as a control. Tumors >4mm, tumor adjacent tissues, and normal non-adjacent tissues were harvested after rectal treatment with either control PBS or VAX-IP minicells, a potential immunotherapeutic. VAX-IP minicells are derived from bacteria but lack the parental chromosome, preventing them from replicating or becoming infectious. VAX-IP have proved to have an anti-tumor role in bladder cancer cells. It is hypothesized that VAX-IP will suppress tumor growth and pro-tumor mediators that are known to cause colon inflammation, including arginase 1, interleukin (IL) 6, IDO, IL-17, FoxP3, and IL-10. Significance has been found in the reduction of tumor number after VAX-IP treatment, suggesting that VAX-IP are effective in reducing malignant growth. Total tumor number decreased in groups treated at 14-19 weeks, sacrificed at 26 weeks (p=0.015) and treated at 8-13 weeks, sacrificed at 26 weeks (p=0.015). In terms of immune marker expression, preliminary statistical analyses for treatment groups do not show significance in the 8-13 sacrificed 26 weeks or the 14-19 sacrificed 20 weeks; however, mice in group 14-19 sacrificed at 26 weeks are still under investigation. These studies will help determine if VAX-IP minicells have potential for the treatment of colon cancer in patients.

121 10:15 am

Fast and Efficient Comparison of Metagenome Sequences from Patients Byron Garcia, Computer Science (U)

Motivation: Metagenomics DNA sequencing generates a vast amount of genome sequences that prior software can no longer analyze in a timely manner. Sequencing microbes by metagenomics is impacting all biological sciences, including medicine. We are using metagenomics to compare samples from patients over time during the course of a disease. Over the last decade DNA sequencing has undergone monumental advances, but when it comes down to saving a life, every second is crucial. Therefore we need faster, more efficient code to analyze DNA sequences.

Results: We are in the process of developing a program in C that will be able to process files of DNA sequences. We acquire two sets of data from the same individual, before and during a disease or exacerbation, and count small fragments of the DNA of length k, called k-mers. This allows us to compare mutations between those two samples and to a larger set of biomes. Our test results showed the software is able to analyze a file of 17 million sequences using 7-mers in about two hours.

Conclusion: Building upon our initial approaches we are refining our algorithm to increase efficiency and reduce memory requirements. We've identified some areas to improve on and know exactly what direction we need to approach next.

Session A-5

Oral Presentation: Behavioral & Social Sciences OR2 Friday, March 3, 2017, 9:00 am Location: Metztli

122 9:00 am

How Crisis Communication Theory Affects Nonprofit Civil Rights Organizations

Zackary Albrecht, Journalism with an emphasis in Public Relations (U)

Major crises happen daily in today's global environment. For example, there were a reported 963 fatal police shootings in 2016, according to data collected by The Washington Post. And with each of this crises, corporations, nonprofits and individuals respond differently.

This original quantitative research project examines crisis communication strategies and their effectiveness. These strategies will be applied to a nonprofit civil rights organization in public relations and are guided by Coombs' (1998) crisis communication theory.

This study is to examine how nonprofit civil rights organizations respond to a crisis and the effect the organization's response will have on their donation efforts, reputation and relationships.

Using an experiment, this study will empirically address the issue. Participants will be informed about Pride Fund to End Gun Violence, a political action committee (PAC) that endorses political candidates who focus on gun-policy reform to ensure safety for all and supports LGBTQ equality.

Participants in the experiment will read a news article about a crisis situation. After the simulated crisis, participants will read a statement by Pride Fund in accordance with Coombs' crisis communication theory, then be given a posttest questionnaire regarding their likelihood of donating to Pride Fund and their attitude toward the organization. A control group will receive the same posttest questionnaire about Pride Fund but will not read the news article about the crisis.

The scales that will be used are Items for Reputation and Crisis Responsibility by Coombs (1998), Attitude toward the Charity by Dean (2002), Relationship Scale by Sweetser and Kelleher (2016) and Donation Likelihood by Venable, Rose, Bush and Gilbert (2005).

The hypothesis for this study predicts that donations and support of a nonprofit civil rights organization will be directly affected by their response after a crisis happens.

The research question for this study asks if Coombs' crisis communication strategy is applicable to nonprofit civil rights organizations such as Pride Fund. The results from this study will determine if Coombs' crisis communication strategy is generalizable and applicable to nonprofit civil rights organizations.

123 9:15 am

Framed: A Political Framing Experiment in Public Relations

Dylan Grise, Journalism and PR (U)

In a society where media seems to be the one of the largest components for the social understanding of a given issue (Happer, 2013), delivering an accurate message to the masses begins with the media source's ability to deliver an unbiased and clear piece of information. Given the current level of government and media disconnect described by Press Secretary, Sean Spicer, the search for truthful media clarity begins with the confidence that the media is delivering the most unbiased message possible. While the message may be found within the text of an article, the picture chosen by the media source to preface the information may have a direct relationship to how the information is received. This research project examines the effect, if any, of the interpretation of a neutral article based off a picture placed at the beginning of an article by the media source. This research study will be examining our data by applying the public relations mass media theory of framing, an offshoot of the agenda-setting theory (McCombs, Shaw, and Weaver, 1997), as the foundation for the interpretation of the collected data. While there are a myriad of ways in which a public relations professional may use framing in their delivered message, the overall desired result is to provide the context in which an article is understood (Hallahan 1999). In testing visual framing in this public relations context, this study employs a quasi-experiment with random cell assignment of a nonprobability student sample. The independent variable manipulated in this study was the image accompanying a neutral article about prospective changes to the Affordable Care Act (ACA), otherwise known as Obamacare. By manipulating the image accompanying the article, the researchers will investigate the effect each of the three stimuli or control have on the dependent variable; one's reaction to the news item. Participants' emotional response to the stimulus will be measured using the Lang (1985) Self-Assessment Manikin (SAM). adSAM, as the measure is more commonly referred to in academic literature, provides an alternative to verbal self-report measures (Morris, 1995). This study hypothesizes that participants who see a more human image portraying ACA will feel a diminished level of dominance.

124 9:30 am

Communicating Commitment Through Activism: Individual Actualization and Creating Common Ground Through Activist Organizing

Jonathan Veal, Communication (M)

Non-profit organizations have nearly doubled in number in the last decade. Considering the explosive growth of such entities, it raises questions regarding how non-profits communicate their values, goals and methods to their members. This paper considers what patterns of communication are present in successful non-profits. The study uses a qualitative approach and content analysis to consider the narratives of individuals who are established members of various non-profit groups. Six interviews were considered to find common communication patterns that existed across all the narratives. The study concluded that there were three clear communication patterns present in each narrative: Initially investing in the organization, communicating responses to resistance, and expressing continued commitment. Participating in each of these communication patterns motivated the activists to continue their work. Furthermore, the central factor that motivated those interviewed was a belief that their values matched that of the organization they were involved with. These findings provide a significant contribution to our understanding of communicating within non-profits. It allows us to understand the qualities that constitute successful communication between members and give new a perspective through the narratives that reflect actual lived experience.

125 9:45 am

The Role of Civil Society in Implementing UNSCR 1325 in Africa's Great Lakes Region Claire Schmitt, International Security and Conflict Resolution (U)

The United Nations Security Council Resolution 1325 (UNSCR) which seeks to protect, promote, and encourage the full participation of women in peace building operations has been utilized to help resolve armed conflict within Africa's Great Lakes Region. By examining secondary sources and content analysis I explore the National Action Plans (NAPs) of Rwanda, Burundi, Uganda, and the Democratic Republic of the Congo, which have adopted a 1325 NAP for their achievements and shortcomings. Furthermore, I consider the variations in the Great Lake Region's 1325 NAPs with regards to the roles of civil society in the drafting and implementation of the NAP to determine if UNSCR 1325 is likely to be successful in these countries. I argue that in order for UNSCR 1325 to be successful and to be accepted by a country as a norm, then the NAPs must include women's civil society organizations in the drafting and implementation phases. Preliminary results demonstrate that applying a bottom-up approach, by means of women's civil society, is necessary to the advancement of UNSCR 1325 objectives and implementation as it facilitates an ongoing cycle of progress and the ultimate promotion of peace.

126 10:00 am

Sustainable Development in Developing and Post-Conflict Nations

Connor Rutledge, Sustainability (U)

Developing nations and nations emerging from post-conflict zones face a lack of infrastructure and a rising rate of urbanization and development. Through sustainable development practices and programs, these nations will be able to grow and develop into the same types of urban infrastructure directly, that many developed nations are converting to from older, carbon intensive, infrastructure. I build on theory from sustainability and political science - specifically sustainability, weak state capacity, and social capital literatures. I also draw upon my own experience in sustainable tourism, as an interdisciplinary approach is needed to improve peace building efforts. From this theoretical background, I argue that sustainable development will alleviate weak state capacity and increase social capital. To explore this argument, I employed qualitative research methods, namely case study analysis. This study was an intensive case study of Ghana, with minor comparative cases of sustainable tourism and developmental practices in Kenya. The results of implementing sustainable development and practices in Ghana have shown to start to eradicate poverty, increase social capital and state capacity through increasing access to public goods, occupational health and safety (OHS), and renewable/alternative energy production. Comparative results from other case studies will show why certain measures and practices may work better than others

in developing nations, while addressing how sustainable development and practices from a bottom up perspective have shown to be beneficial for Ghana.

Session A-6

Oral Presentation: Humanities OR1 Friday, March 3, 2017, 9:00 am Location: Templo Mayor

127 9:00 am

The Syrian Refugee Crisis: Examining Right-Wing Populist Party Influence on EU Immigration Policy Jessie Dietz, Political Science (U)

Within the last decade, the international community has faced an influx of refugees fleeing conflict zones across the Middle East. Since 2013, the leading origin country of these individuals has been the Syrian Arab Republic. Nearly five million of the 21.3 million refugees displaced worldwide have been from Syria. The war on terror has perpetuated an ideology of fear that has since leaked into political systems across the globe. My thesis focuses on the immigration policies of European Union nation states since this dramatic increase. This research specifically looks at the influence of right-wing populist parties on national immigration policy that have, in turn, dismantled European Union policies as a whole.

Ultimately, my research utilizes scholarly theory on policy change to examine the varying immigration policies of EU nation states with and without the right-wing populist variable. Additionally, I analyze the social facets of right-wing populist parties in order to reveal the effect anti-immigration rhetoric has on current policy stagnation. I have and will continue to draw upon scholarly articles, contemporary news reporting and United Nations data to develop my conclusions.

Preliminary findings show that there is a correlation between the presence of right-wing populist parties and mainstream policy change. However, in order to effectively apply this theory across various countries within the EU, it is necessary to consider supplementary political variables.

In today's political climate, it is pertinent to examine the indirect influence social ideas have on immigration policy gridlock. This type of research can help lawmakers address the need for social integration in an organized system that is enacted in all states at all levels.

128 9:15 am

Law 348: The Struggle to End Violence Against Women in Bolivia

Emma Mackey, Latin American Studies (M)

During the week of February 11, 2013, Bolivians learned about the alarming murder of reporter Hanalí Huaycho. Her marriage had a history of violence, and ultimately she was stabbed to

death multiple times by her husband. While feminicides (the murder of women and girls because they are female) were not uncommon in Bolivia, the press took special care to broadcast the death of their fellow reporter. Hanalí s death was the impetus for the passage of a Bolivian law that had been in the works for many years. Law 348, the Comprehensive Law to Guarantee Women a Life Free from Violence, passed a month after Hanali's death. Violence against women (VAW) is a pervasive issue both in Bolivia and in the Americas. An analysis published in 2013 by the Pan American Health Organization (PAHO) and the Centers for Disease Control and Prevention (CDC) compares rates of VAW in 12 Latin American and Caribbean nations. Bolivia represents the highest rate of VAW among all the nations included in the analysis. Given the prevalence of VAW in Bolivia, my thesis research primarily focuses on the implementation of Law 348. While it is significant for women's rights, it does not guarantee women a life free from violence without proper implementation. Despite the passage of Law 348, reported feminicides have remained around 100 per year. With these alarming numbers in mind I conducted qualitative interviews with various professionals in La Paz, Bolivia in May 2016. This research was funded by the SDSU CLAS-CAL Research Travel Grant for Latin America. I will present the findings based on my research in Bolivia at the Student Research Symposium on a panel with other CLAS-CAL recipients.

129 9:30 am

Dos Crímenes: Parody and Questioning of Mexico's Dirty War

Jovana Gomez, Spanish (M)

In this work, I present the literary work of Jorge Ibargüengoitia, *Dos Crímenes* or Two Crimes and how it denounces and exposes Mexico's unknown Dirty War (1968 – 1982). Written during the 1970s and published in 1979; the book depicts how he was able to talk about the almost unknown Dirty War in Mexico during an authoritarian period. Through literary devices such as parody, Ibargüengoitia succeeded illustrating Mexico's unknown Dirty war. Before the year 2000, former president, Vicente Fox, declassified documents that gave evidence and validity to the existence of the Dirty War. Only a few authors dared to talk about this unknown war, Ibargüengoitia was among one of those authors. Through his writing, Ibargüengoitia contributed to make this war known and furthermore gave voice to all the "*desaparecidos*", the missing innocent citizens the government took.

130 9:45 am

The Child Assimilation Agenda: The Connections Between Federal Indian Policy and Indian Representations in DC Comics Desmond Hassing, Theatre (M)

This paper presents the findings of the National Indian Project, begun by the paper's author in 2015, which seeks to create an online database of the locations of stories which contain American Indian, First Nations, and Pacific Islander representations within DC/National Comic Books between the creation of the first modern Superhero comic book in 1938 and the commonly held demarcation line between the Silver Age and the Bronze Age of comic books in 1974/75. The database, which now contains reference locations for more than 1000 individual comic book stories containing these Indian representations, was compiled from a survey of more than 10,000 issues, this represents the vast majority of the issues produced by DC Comics during this era.

The author will discuss the manner in which this database is formatted and how other scholars can easily access the information contained within as a tool for their own research. Further the author will present the metric findings of the study and suggest a connection between the specific types of representations that appear in different eras of these comic books and the relation of these stories to Federal Indian Policy and the United States Government's continued efforts to force and cajole Indigenous people to assimilate to mainstream American society.

131 10:00 am

Landfill Harmonic: Ecomusicology and Activism Kathryn Smart, Musicology (M)

The film, Landfill Harmonic, is an uplifting story about La Orguesta de Instrumentos Reciclados de Cateura, Paraguay (the Recycled Orchestra), a community of young musicians who perform classical music on instruments created from waste collected at the nearby landfill where they live. Inspired by musician and environmental engineer, Favio Chávez, the film reveals the orchestra community's ingenuity, resilience, and celebration of its unlikely fame as their story goes viral. Personal, social, and environmental issues unfold as the orchestra rehearses and performs for local and international audiences. The popularity of the Landfill Harmonic teaser trailer and success of its subsequent multi-award winning documentary may be attributed in part to Landfill Harmonic's novel approach to activism. This presentation will investigate key factors in the Landfill Harmonic documentary that propelled an impoverished community towards social and/ or environmental change. As with Chávez and his musicians, the environment is an actor in Landfill Harmonic. Through the lens of ecomusicology, I will examine the film and published interviews; explore themes, elements, devices, and incongruities; and, identify relevant constructs from the literature such as place, listening, or musicking. I will use this foundational work to examine the two fundamental approaches to activism described in the literature: the apocalyptic and the nostalgic. I hypothesize that these findings will support my thesis that Landfill Harmonic's hybrid apocalyptic-nostalgic activism contributed to its viral video and film festival success, and is a model for a broader approach to activism.

Session A-7

Oral Presentation: Business, Economics & Public Administration OR1 Friday, March 3, 2017, 9:00 am Location: Visionary Suite

132 9:00 am

A Hierarchical Aspect-Based Sentiment Analysis of Online Reviews for Business Consulting Sunny Kim, MSIS (M)

As online review sites became more pervasive, both research and business interest on how to analyze and utilize it are also growing. The representative data analytic methods to address the online reviews are sentiment analysis and topic modeling. While other academic group have conducted the studies to figure out the critical factors to measure customer satisfaction using survey method.

In our study, we suggest efficient hierarchical aspect-based sentiment analysis system on Yelp online reviews (N=606,968) of the restaurant business by applying the various methods of sentiment analysis and topic modeling with the domain knowledge. For the topic modeling, we gather the topic categories and sub-categories, as well as seed words regarding each category. We then extract the category information from the previous studies to address the critical factors explaining customer satisfaction in the restaurant business: food quality, service quality, and price as high-level categories.

First, it is necessary to label appropriate topics on review sentences with non-aspect. For this task, we use the cosine similarity clustering method. By analyzing sentiments on the all topic labeled sentences, we will implement a hierarchical aspect-based sentiment analysis system on the online reviews of Yelp's restaurant businesses. Further, we will conduct the machine learning modeling using all the aspect-level sentiment scores to predict the overall star level of each business. Through this task, we can verify the relative importance of each aspect on overall customer satisfaction and can compare it with the previous survey-based study results.

The practical implication of this research is to provide the strategical improvement to customer satisfaction with the strength and weakness of individual business in each category and sub-category by analyzing the online reviews. The suggested method has several benefits: time and labor cost efficiency, ease at tacking identifies the customer trend changes.

The academic implication is that this study identifies the relative importance of the categorical and sub-categorical factors on the overall customer satisfaction by utilizing online reviews and predictive modeling. It will lead to reveal the similarity and differences of results between our approach and traditional survey-based approach.

133 9:15 am

The Influence of San Diego State University on College Area Property Values Jeremiah Taylor, Real Estate (U)

To better understand real estate values in the local area of San Diego State University I have evaluated micro data on recent property sales, rental rates, vacancy rates, capitalization rates and population statistics. Through my research it can be noted that the presence and expansion of San Diego State University has influenced changes in property value and rental rates in the College Area. This presentation will help anyone interested to see how San Diego State University has influenced real estate in the College Area.

134 9:30 am

Iraq; The Growing Economy and Business Opportunities

Naba Al-jawad, International Business (U)

Doing business in the third world can be very difficult. However, there can be many opportunities as well given the growing population and the growing demand for goods and services in the developing economies. Iraq is one of those countries that can present immense business opportunities. Despite the ongoing security battles and the war on ISIS, it is a growing economy. The goal of this project is to examine the business environment of Iraq and identify opportunities as well as challenges in the main economic sectors. The primary motivation for this study is to provide a better understanding of Iraq as a place for business for potential investors and broader business community.

I draw on archival sources of information to summarize the historical background of Irag that impact the most active industry sectors: tourism, utilities, energy, banking, and transportation. I also assess the general economic environment. I then summarize the main risks and challenges characterizing the Iragi economy. I also identify institutions such as the Iragi Research Foundation for Analysis and Development (IRFAD) which support business and tourism in Iraq. Finally, I focus my analysis on one particularly promising region of Iraq, Dhi Qar, which has a population of two million people and a growing tourism sector. I sought to gather primary data on the business trends in this region by contacting some of the political and business leaders from Dhi Qar. Some of my contacts include the deputy chairman of board in Thi Qar, the department chair of the different universities in Thi Qar, and research professors that have conduct or lead research programs about the marshes.

I conclude my research summarizing the main opportunities and risks for operating business in Thi Qar and Iraq in general.

135 9:45 am

Solar Power: Today, Tomorrow & Beyond Levi Imbuzan, International Business (U)

Motivation: As our world becomes ever more globalized and developing nations race to become developed nations, the effects of rampant greenhouse gas emissions threaten to drastically alter our climate, our planet, and our very way of lives. As countries, people, and corporations around the world realize the catastrophic effects that we have been having on our planet for the past 200+ years, changes are being realized to minimize and alter our carbon footprint on the atmosphere. The main purpose of this project is to understand one aspect of this green revolution and determine if and how it can be harnessed for a cleaner world and to make a profit.

Problem Statement: Solar power utilization has exploded across the globe and the installation and generation cost from solar panels have plummeted downward. Is this, however, simply a passing fad or truly a market shift in the energy sector that can be invested in and capitalized on for decades to come?

Approach: My report seeks to answer this question through meticulous internet, library, primary and secondary research of the current and future growth trends of the solar power industry abroad, in the United States, and right here at home in San Diego. While I primarily sought to synthesize my information about the solar power industry from archival sources I also sought to gain insights from interviews with industry leaders.

Conclusion: The preliminary research so far suggests that we are indeed witnessing an industry shift that has been very profitable for the past decade and will continue to be profitable well into the foreseeable future. Nations across the globe are making drastic changes in their energy policy and are increasingly turning to solar power and other clean energy technologies to supply their ever-growing energy needs in the future (In my report I provide specific examples and discuss implications for both practitioners and academics).

136 10:00 am

Professional Skepticism in Auditing: The Challenge of Unconscious Biases Fiona Jahn, Accounting (U)

This study discusses the impact that six common cognitive biases—the framing effect, confirmation bias, overconfidence bias, availability bias, anchoring bias, and rush-to-solve bias have on auditors' professional judgment and skepticism. We examined the contextual factors that create opportunities for these biases, and how managing these contextual factors can mitigate these biases. We also showed how existing technologies could be used to mitigate these cognitive biases. Auditors' cognitive biases play significant roles in audit engagements. These biases are subconscious tendencies that can result in auditing deficiencies. The goal of our analysis is to make practitioners and regulators aware of these subconscious tendencies so that they can avoid or reduce their influence. This project was done in two-phases. The first phase we reviewed existing psychology theories and experimental findings on cognitive biases. The second phase we identified implications of the extant findings for practitioners and regulators and proposed practical solutions to reduce or eliminate potential compromises to auditor's professional skepticism. The outcome of this study is a comprehensive framework that can be utilized by auditing practitioners and regulators.

137 10:15 am

Time Scale Profile of Risk in Foreign Exchange Markets

Jeremy Juybari, Economics and Interdisciplinary Studies (U)

Financial risk is the possibility of losing capital on an asset; it is a crucial component in the investment decision process. This risk is not only related to stocks or bonds but also currencies, such as unexpected central bank policy or abrupt changes in macroeconomic policy. The purpose of this exploratory study, is to analyze how rapid currency moves are reflected in the derivatives (options, forwards) market over different time scales. Using a wavelet decomposition, we isolated varying scales of the underlying currency and its related derivatives. There seems to be a consistent scale-based relationship emerging across both financial instruments: the derivatives exemplified a tent-shaped correlation pattern with the spot rate. By comparing the correlations between the spot and forwards, and between the spot and options, at the same scale, and across scales, we are beginning to paint a picture of how risky the derivatives are over different investment horizons. This has important applications in risk management across a variety of fields: portfolio management, central bank policy, corporate finance, and international trade.

Session A-8

Oral Presentation: Engineering & Computer Science OR1 Friday, March 3, 2017, 9:00 am Location: Legacy Suite

138 9:00 am

Mass Flux Correlation with Spread Rate for Downward Flame Spread over PMMA Blake Rhoades, Mechanical Engineering (M)

The burning rate of fuel and the laminar flame spread rate are both well studied topics for flame spread in downward configuration. Yet, despite well-developed theories, not much experimental data is available to correlate the two. In this work, experiments are performed under ambient conditions in a downward spread configuration for a wide range of flat and cylindrical samples of Poly-Methyl Metacrylate (PMMA). By analyzing the video of the flame propagation the instantaneous spread rate is obtained using a recently developed MATLAB based tool called the Flame Analyzer. The shape of the pyrolyzing fuel is carefully measured after extinguishing the flame during a steady propagation. The spread rate and the burn angle, defined as the angle subtended by the pyrolyzing surface with the axis of the fuel, are correlated, producing an expression for the burning rate in terms of the burn angle and flame spread rate. As the fuel thickness is increased, the burn angle and the burning rate decrease and reach asymptotic limits for thermally thick fuel. The thick-fuel limit is used to predict the burn angle for cylindrical fuel. Experiments with cylindrical fuels confirm this prediction within the experimental uncertainties.

139 9:15 am

Design and Mechanical characterization of PI based MEA's

Arvind Balasubramani, Mechanical Engineering (M)

Flexible microelectrode arrays (MEA's) have been in existence since early 1950 and have been widely investigated for its potential solutions for the treatment of Parkinson's, Alzheimer's and other neurological disorders that affect the sensorimotor functioning. The research is focused on fabrication and mechanical characterization of polymer based MEA for neural applications. TA Instruments' Dynamic Mechanical Analyzer (DMA) is used for the tensile stress characterization of the device. Thin metal traces interconnect electrode sites to bump pads region where an external PCB is mounted. The metal layer is insulated on both the sides by spin-coating a photosensitive polymer HD4100. During the process of fabrication, the Polvimide lavers undergo multiple curing cycles during which there is a substantial change in mechanical properties of the device. Post-fabrication, one batch of devices is tested to determine the modulus of elasticity and the load bearing capacity of the device. This constitutes the dry test. Another batch of devices is soaked in PBS solution for a period of 14 and 21 days and later tested on the DMA for studying the effects of adsorption on the aforesaid properties. A multi-frequency sweep at isothermal condition is also studied to determine the glassy transition temperature of the cured PI devices. Similar tests are carried out for Duramide based devices that will establish a better understanding on the compatibility of these materials for neural applications. This research will provide the basis for long-term studies on favorable material properties for stable neural implants.

140 9:30 am

Integration of Strain Sensors on Brain-Computer Interface Neural Probes

Surabhi Nimbalkar, Bioengineering (M)

Various neural probes have been developed for sensing electrical as well as electrochemical neural signals since 1950. When neural probes are interfaced with brain tissues, neural cells are typically prone to microglial scarring due to difference in material stiffness i.e. difference in Young's modulus of brain tissue and neural probe. The glial scarring may reduce the neural sensing ability of neural probe. Flexible polymer substrate of neural probe lowers the mismatch in stiffness of brain tissue and neural probe. This research is based on hypothesis that during formation of microglial scarring around neural probe, the probe undergoes strain variations. Hence, the strain variations can be used as indicator of microglial scarring around the probe.

The research focuses on the integrating strain sensor with metal based array of microelectrodes on flexible substrate for neural sensing and simultaneous strain sensing. Resistive strain sensor of 6.5 mm2 size sensing strain in horizontal and vertical directions is integrated with the array of 9 carbon microelectrodes on flexible polymer substrate. Strain gauge and microelectrodes are fabricated from thin layer of gold (300 nm) by sputtering and metal evaporation processes, whereas polyimide (HD4100) is used as base and top insulation layers of neural probe. As thin-film gold layers are highly stretchable and have good electrical conductivity, these are ideal for resistive type strain sensor.

The standalone impedance of the strain sensor is considered as resistance, Ro at zero strain recorded by Solartron Impedance Analyzer. Maximum tensile strain(10%) experienced by the neural probe is measured at a fracture failure point in tensile testing using Dynamic Mechanical Analyzer (DMA). To determine the variation in impedance of gold thin-film strain sensors with varied strain%, ramping tensile force (1N/min) is applied using DMA and strain gauge impedance is measured at 2%, 4%, 6% and 8% strain. The direct correlation is observed between variation in strain% and measured impedance values at strain sensor. This research will provide a novel approach of studying interface between brain tissues and neural probe by showing variations in strain% experienced by neural probe due glial scarring.

141 9:45 am

Microfluidic Platform for Separating Cancer Cell Clusters and Individual Cancer Cells from Whole Blood through Inertial Focusing and Patterned Microchannels

Manisha Phadke, Mechanical Engineering (M)

The next step in cancer diagnostics and treatment is personalized medicine i.e. medicine and tests tailored to a specific patient. To make this possible it is essential to research the cancer differentiation and metastasis. One school of thought states that, in every type of cancer there are cells with stem like characteristics i.e. they have the capacity to differentiate and proliferate. While the other states that every cancer cell cluster has the capacity to metastasize. To study these cells, it is essential to separate them from blood. There are many techniques by which this can be done. Inertial focusing in spirals and separation by antibody coated microchannels are two such techniques. Our project is to design and fabricate a device which will combine these two techniques to separate individual cancer cells and cancer cells clusters from whole blood. This device has two parts. One part will consist of two spiral channels wherein, in the first spiral RBCs will be separated from the whole blood sample. The

remaining sample without the RBCs will be used as an input for the second spiral, where cancer cell clusters will be separated from rest of the cells. Both the separations are possible due to the difference in their sizes using Dean Vortices. Both the outputs from the second spiral will be the inputs for two capture beds consisting of antibody coated herringbone patterned microchannels. Once the cells pass though the channels, cells with relevant antibodies will get attached to the walls of the microchannels while rest of them will pass through. This type of inertial focusing will replace the centrifugation method used to concentrate samples for use in antibody based separation, while keeping the cell cluster viability intact and by using herringbone microchannels specific cell types can be captured.

142 10:00 am

Production of Liposomes by Microfluidics for Investigating Single Molecule Reactions in Liposomes

Yasna Behmardi, Bioengineering (M)

Liposomes are spherical vesicles consisting of at least one phospholipid bilayer. These lipid vesicles are capable of encapsulating hydrophilic substances inside their aqueous core. Their dimensions could vary from tens of nanometers to hundreds of micrometers depending on the preparation procedure and intended use. By utilizing microfluidic techniques, liposomes can be formed in a confined microenvironment and by manipulating parameters such as total flow rate, and the flow rate ratio of the solvent and aqueous phases, one can control physical properties of the end product such as liposome size, size distribution and lamellarity. In this project, microfluidic hydrodynamic focusing is used to apply a diffusive mechanism in a miscible two phase system in which fully solvated lipids self-assemble into liposomes as the two phases (water and alcohol) interdiffuse. There are fundamental biological questions that can be asked regarding the internal environment of liposomes. It is hypothesized that liposomes can be used to isolate and delay single molecule reactions and if these reactions are delayed they can potentially be measured and observed.

143 10:15 am

Microfluidic Platform to Create Micro Vortices to Enhance the Capture Cancer Stem Cells Shreyas Shah, Bioengineering (M)

Cancer Stem Cells (CSCs) are tumorigenic cells that have characteristics similar to normal stem cells but have the ability, to generate cells, which are found in the cancer sample. The rare amount of CSC cells in the whole blood makes isolating them from other cells a daunting task. Well defined phenotypes of different CSCs makes immunocapturing technique of CSCs more desirable. A microfluidic device is a proven platform for user constrained microenvironments which can be optimized by small scale volumetric flow experimentation. In this study, we showed a micromixer design (Staggered herringbones) can be optimized to get the maximum chaotic mixing within antibody coated on the microchannels to further capture CSCs. Our device's design includes the configuration of Staggered Herringbones on top and bottom of the channels (Staggered High Low Herringbones- SHiLoH). It was constructed using polydimethylsiloxane (PDMS) foundation and thinly coated with an alginate hydrogel derivatized with streptavidin. We also compared between the Single-walled Staggered Herringbones device and the Staggered High Low Herringbones device with different orientation of the herringbones. The results showed that the micro vortex generated within the microchannels of Staggered High Low design makes the device more efficient than the Single-walled staggered Herringbones. Further, the non-stickiness of alginate and antigen-specific antibodies can allow better target-specific cell isolation. Our qualitative and quantitative results demonstrate the advancements in cancer stem cell isolation and more comprehensive single-cell and cluster analysis.

Session A-9

Poster Presentation: Behavioral & Social Sciences P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

144 9:00 am

Living with Thirdhand Smoke Toxicants: Do Smoking Policies Make a Difference? Samuel Padilla, Psychology (U)

Thirdhand smoke (THS) refers to the complex mixture of chemical compounds derived from secondhand smoke (SHS) clinging to surfaces and embedded in materials of an exposed environment. To prevent SHS exposure, public policies in the U.S. prohibit smoking in most public indoor areas, and many private homes and apartment buildings also restrict smoking. The purpose of this study was to describe the types of smoking policies that exist in low-income multi-unit housing in San Diego County, to examine the residents' knowledge of these policies, and to examine the effects of these policies on THS residue found in homes. With assistance from local community organizations, 86 residents from 10 low-income, multi-unit buildings in San Diego County were recruited for this study. Interviewers surveyed property managers for smoking policies of their building, and residents for perceived policies and smoking history in their homes. THS pollution was measured using surface wipes collected from participants' homes and analyzed to determine nicotine concentrations (µg/m2) using LC-MS/MS. Official and perceived policies were compared to examine agreements and disagreements. Overall, 60% of the buildings prohibit smoking inside homes, and 67% prohibit smoking on balconies or porches. Residents in agreement with official policies about smoking inside homes consisted of 65% of our sample. One-way analyses of variance were conducted to compare level of THS residue between residences with

different smoking policies. There were no significant differences in THS levels in homes and buildings with different smoking policies. A significant positive relationship was found between tobacco use in a home over the past 12 months and the level of THS residue (R2 = .08, F(1, 83) = 7.32, p< .01). Findings suggest that the presence and implementation of smoking bans in a building and knowledge of the bans among residents are not associated with levels of THS found in private residences. For existing smoking bans to protect indoor environments from THS, implementation of policies, monitoring, compliance, and feedback have to be improved. Otherwise, nonsmoking residents continue to live with THS pollutants long after cigarettes have been smoked.

145 9:00 am

The Toxicant Lurking in Your Walls: Thirdhand Smoke Accumulation in Low Income Housing Taylor Shrum, Psychology (U)

Thirdhand smoke (THS) is a mixture of chemical compounds left behind by secondhand smoke that accumulate in indoor environments, creating a reservoir of indoor toxicants. Exposure to THS especially in young children may cause adverse health outcomes through inhalation, dermal transfer, and ingestion. Previous research estimated mean nicotine surface concentrations in smoker homes to range from 10 to 100 µg/ m2, while nonsmoker homes typically show mean levels <2 µg/ m2. This study describes the heterogeneous distribution of THS in different indoor environments and explores potential origins of excessive THS levels found in low-income housing. Ninety residents of low-income housing in San Diego County were recruited to examine THS prevalence and efficient mitigation methods. In each home, two surfaces were tested using standardized surface wipe sampling methods and analyzed for nicotine concentration using LC-MS/MS. Participants completed an interview regarding smoking habits and home smoking policies. Five homes of nonsmokers with surface nicotine levels more than 100 times greater than typically found in nonsmoker homes were selected for in-depth analyses. Surface nicotine levels in the present study ranged from < 0.05 $\mu a/m^2$ to 3.926 $\mu a/m^2$ (Mdn = 2.4 $\mu a/m^2$). Seven percent of participants noted they, or someone else who lived in the home, smoked tobacco in the past 30 days and of those, 3% reported tobacco use occurred indoors. Of the 90 homes sampled, 14% percent showed nicotine levels > 20 μ g/m2, ten times higher than in previous studies of non-smoking indoor environments. Five percent of homes had nicotine levels > 210 µg/m2 of nicotine, about 100 times higher than typical nonsmoker homes. Case studies conducted on these five nonsmoker homes suggest that long-term smoking history in the home and building may be responsible for persistently high THS pollution. The prevalence THS in homes of low-income nonsmokers was higher overall and had more extreme levels of THS levels than previous studies found. Understanding the factors responsible for excessively high levels can be helpful in preventing future THS pollution, identifying homes for mitigation, and developing strategies for removing the mixture of toxicants from indoor environments of nonsmokers.

146 9:00 am

The Additive Association of Indoor Cigarette and Marijuana Smoking on Potential Exposure to Fine Particles

Alexander Ivan Posis, Epidemiology (M)

Introduction: Exposure to fine particles (<=2.5 microns) from any source can induce respiratory damage and exacerbate bronchitis and asthma. The impact of cigarette smoking on indoor fine particle levels is well known, but the impact of marijuana smoking has not been described. That description is an essential first step toward understanding the public health implications of increasing marijuana use. Using data from 193 households, we examined associations of indoor marijuana and cigarette smoking with fine particle concentrations and tested whether the two particle generating events (PGEs) have a synergistic effect on fine particle levels.

Methods: As part of a larger trial, air particle monitors were placed in 298 homes of families with at least 1 cigarette smoker and 1 child under the age of 14. After monitors continuously measured fine particle counts (0.5 to 2.5 microns) for at least 7 days, participants were interviewed about past 7-day frequency of cigarette and marijuana smoking, other PGEs (e.g., burning candles) and ventilation activities such as exhaust fan use. Dichotomized survey responses (any vs. none) from 193 homes that provided data for all relevant PGEs and ventilation activities were used along with mean air particle counts from the 7-day period. Unadjusted geometric means (GMs) were computed to summarize air particle concentrations. After log transformation of mean air particle counts, multivariable linear regression models were used to adjust for other factors associated with fine particle levels. Synergistic effects were then tested by including a multiplicative (cigarette smoking) (marijuana smoking) interaction term in the regression model.

Results: Homes without indoor smoking had GM counts of 1985 particles/0.01 ft^3 while homes with marijuana smoking only, cigarette smoking only, and both cigarette and marijuana smoking had GM counts of 2869, 3019, and 5250. Regression models adjusted for home size, other PGEs, and ventilation activities indicated that marijuana smoking was associated with a 68% increase in GM counts while indoor cigarette smoking was associated with a 57% increase (p's<0.001). No synergistic effect was detected between marijuana and cigarette smoking (p=0.586).

Conclusion: Indoor marijuana and cigarette smoking were significantly associated with elevated fine particle concentrations; their relationship was additive (not synergistic).

147 9:00 am

The Association Between Secondhand Smoke and Childhood Asthma in the Respira Sano Study Janeth Juarez Padilla, Sociology (U)

Children exposed to secondhand smoke have become vulnerable to a diverse set of diseases. Those who are in the presence of the smoke of a burning tobacco product are susceptible to cancer, heart disease, a slowed development of the lungs, and increased mortality. In addition to increasing the risk of cancer, secondhand smoke exposure is associated with a worsening state of asthma. The indoor, outdoor, and car exposure to secondhand smoke can increase the occurrence of asthma symptoms. Continued exposure of secondhand tobacco smoke can increase wheezing and nighttime asthma exposure. Childhood asthma is disproportionately found in the Latino community and Latino children experience higher indoor and outdoor allergens. The Respira Sano study aims to develop effective intervention programs to improve quality of life, children's asthma control and lung function within the study population living in Imperial Valley, CA. For this study, secondhand smoke exposure and childhood asthma were examined. Baseline data from the home environment survey, full cohort survey, and eligibility screening form the Respira Sano study were used. Data sets were analyzed using the SPSS software program. Correlations between levels of secondhand smoke exposure and asthma clarification will be examined. Initial results from the analyses will be further discussed including an understanding of the impact of secondhand smoke exposure on asthma symptoms.

148 9:00 am

Measurement of Levels of Nicotine, a Precursor of Toxic NDMA, in Source and Drinking Waters of San Diego by Triple Quadruple Mass Spectrometry Brian Lim, Public Health (U)

Drinking water disinfection is a major way to prevent waterborne diseases in our population. Unfortunately, the very process of water disinfection also generates disinfection byproducts (DBPs). A group of DBPs that may be cancer causing chemicals are the nitrosamines such as N-nitrosodimethylamine [NDMA]. NDMA is of particular concern because it is unregulated and is known to form during the process of water treatment and reuse (EPA, 2014)). However, the exact nature of its precursors in environmental waters is still unclear. Nicotine is an alkaloid that is present in environmental waters as a result of both wastewater impact (from smoker excretion) and also the ubiquitous presence of cigarette litter in our urban environments. Chlorination of alkaloids such as nicotine has been shown to produce a number of different compounds including NDMA (Wu et al., 2014). Our general hypothesis is that nicotine present in source drinking waters in San Diego may well be an important precursor for the formation of NDMA when these waters are disinfected using chloramines. However, little data is available on the levels of nicotine (as an NDMA

precursor) and NDMA in drinking waters of San Diego. The main objective of this study was to develop a solid phase extraction (SPE) method and liquid chromatography-tandem mass spectrometry (LC/MS/MS) analytical technique to quantitate the levels of both NDMA and its possible precursor, nicotine, at environmentally relevant (part per trillion) levels. An SPE method using Oasis HLB cartridges to concentrate nicotine followed by elution with methanol was shown to yield nearly 90% recovery of nicotine from drinking water samples spiked with deuterated nicotine. Nicotine levels in 3 samples of locally obtained bottled waters were measureable but low, at about 2 ppt. Several (>5) different extraction methods for NDMA from water were tested and directly compared, but recoveries of deuterated NDMA were low (less than 30%), suggesting further work is needed to develop this as a robust LC/MS /MS method for NDMA analysis.

149 9:00 am

How Vocabulary Supports Lexical Processing in Young Bilinguals

Lauren Thayer, Psychology (U)

Previous work has demonstrated a significant correlation between vocabulary size and lexical processing in monolinguals (e.g., Fernald, Swingley, & Pinto, 2001). However, it is unknown whether this extends to bilingual children learning two languages simultaneously. In addition, it is unknown whether the link between vocabulary size and lexical processing is language-specific or supported by general language ability. The present study investigates whether there are distinct lexical-semantic networks for each language or a shared language system at 18 months of age.

Participants (N = 22, M age =18;12, range = 17;15 – 20;21) were bilingual Spanish-English toddlers. Receptive vocabulary in each language was reported by parents on the MacArthur Bates Communicative Development Inventory (MCDI, Fenson et al., 1993). A modified Intermodal Preferential Looking Paradigm assessed lexical-semantic priming (Arias-Trejo & Plunkett, 2009). Children saw target and distractor image pairs across two conditions: preceded by a word (prime) semantically Unrelated or Related to the target. Primes were presented in both languages.

First, we examined whether vocabulary size in English (model 1) or Spanish (model 2) predicted Proportion Looks to the Target, with Language (L1 or L2), Prime Pair (Cross- or Within-language), and Trial Type (Related or Unrelated) as additional factors. There was a significant main effect of Trial Type (F(1, 7) = 6.80, p = .035), but no effect of English or Spanish vocabulary size, respectively.

Next, we examined whether total conceptual vocabulary (model 1) and number of known translation equivalents (TE, model 2) predicted Proportion Looks to the Target, with Language (L1 or L2), Prime Pair (Cross- or Within-language priming), and Trial Type (Related or Unrelated) as additional factors. Results revealed a significant total conceptual vocabulary X Trial Type interaction (F(1, 7) = 10.41, p = .015) and TE X Trial Type interaction (F(1, 7) = 9.59, p = .017). No other effects were significant.

These results reveal that word knowledge across languages (such as total conceptual vocabulary and TE's), rather than language-specific knowledge, predicts lexical processing. Together these findings point to a shared lexical network that supports the link between vocabulary size and lexical access.

Session A-10

Poster Presentation: Interdisciplinary P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

150 9:00 am

Methanotrophs in Desert Soils Jade Wong, Microbiology (U)

Due to climate change, arid and semi-arid areas around the world have expanded; a third of the plant's biomes may be considered arid land now. These arid lands show a lack of biochemical properties in contrast to natural deserts that serve as a significant sink of atmospheric methane. There are few available studies suggest that the activity of methane-consuming microbes is linked to vegetation.

While plants are often described as facilitators of methane between the soil and atmosphere, the plant-mediated transport of methane is often considered to be non-specific. Based on our initial investigations, the activity and distribution of methanotrophic bacteria in deserts correlate with vegetation cover. The exact nature of the interaction between drought-tolerant plants and methanotrophic bacteria is not known.

We propose that plants and its microbiome cooperate to allow for an efficient capturing of organic material including single carbon compounds as a supplemental resource of nutrients, which support growth and/or survival of plant under water limiting conditions.

In order to investigate the interaction between methane-consuming microbes and desert vegetation, we traveled to Anza Borrego Desert to collect data. The levels of methane, water and carbon dioxide were measured from local plots of soil. Soil samples were also collected in order to further investigate the presence of microbes.

Soil samples were used to extract DNA/RNA in attempts to identify possible methanotrophic bacteria. Alongside working with the original soil samples, we conducted a microcosm experiment using 13C-carbon methane. The 13C-methane is used to enrich the methanotrophic bacteria within the soil samples to further enhance our detection of microbes. The discovery of the native methanotrophic strain may allow for further understanding of plant and microbe relationships.

Further experiments also done in order to test the interactions between drought-resistant plants (Boechera arcuata and Boechera depauperata) and methanotrophs (Methylosinus app, and Methylomonas spp). The first step was by introducing methanotrophs to these drought resistant plants and incubating them in chambers without a water supply and with or without methane. Results from this experiment showed that the activity of methane-converting microbes might contribute to plant survival.

151 9:00 am

Cutting Down Greenhouse Pollutants: Biogas Utilization by Aerobic Methanotrohps

Batool Youhenna, Cell and Molecular Biology (U)

Methane is the major constituent of natural gas and biogas. Many areas of human activities produce biogas (wastewater treatment plants, landfills, animal husbandry). Often the produced biogas is vented or flared. Utilization of biogas or carbon resources that currently contribute to global warming, such as waste, livestock or landfill methane, are generally mentioned among the technological opportunities, yet these are less explored.

The goal of this project was to investigate whether methanotrophic bacteria *Methylomicrobium alcaliphilum* (20Z^R), *Methylosinus trichosporium* (OB3b), and *Methylococcus capsulatus* (Bath) can consume different types of biogases as a source energy for growth. Here tested 5 differed sources of biogas, including biogas from sorghum, corn stover, PEI syrup, bagasse, CDS syrup and miscanthus.

The results showed that *Methylomicrobium alcaliphilum* 20Z^R strain had consumed biogases with higher carbon conversion efficiency and yield of 0.31-1.5, and showed higher growth rate. *Methylosinus trichosporium* (OB3b) showed lower growth rate compared to M. alcaliphilum 20Z^R, and lower yield of 0.23-0.99. *Methylococcus capsulatus* Bath strain reached OD of 0.4-0.6 and a yield of 0.15-1.4. We also found that biogas samples supported higher growth than others.

The impacts of different biogas feeding were further investigated in *Methylomicrobium alcaliphilum* 20Z^R using metabolomics. When compared to the pure methane controls, several pathways pointed to a general effect of biogas feeding on redox state (higher relative oxidative stress) and the elevation of sulfate and the histidine derivative. This observation requires further investigation in order to build a system that can convert biogases to energy or useful products using methanotrophic bacteria.

152 9:00 am

Animal Literature

Xinyi Zhang, Interdisciplinary Studies on Liberal Arts and Sciences (MALAS Program) (M)

Discourse generates on the relationship between human and animal could be endless, admittedly, humans have a lot to learn from animals--it brings positive value and meaningfulness to human life. The term "Animal Literature" has been proposed and individualized as subject classification earlier in Canadathe aboriginals, immigrants and their descendants there have created vibrant and rich animal literature. Canadian animal literature owns a long history, this presentation tends to examine its the nuances in main thoughts in a flow and range of alterations. In order to achieve a better research, the study made an approximate partition into three stages: 1.the animal literature created by Canadian aboriginals before Romanticism period;2.the animal literature created by Canadians of European origin during the period of nineteenth century to the Second World War; 3. The postwar animal literature created by Canadians.

153 9:00 am

A New Copper Catalyzed Method for Conjugate Additions to Unsaturated Carbonyls Paul Smith, Chemistry (M)

A new one pot method for the addition of silyl groups in conjugation with an aldol reaction across α,β unsaturated carbonyls has been developed. In this reaction, a copper catalyst allows for a previously unreported methodology that is a safe and scalable alternative to more commonly used pyrophoric zinc reagents.

The nature of this reaction makes it well suited for large scale synthesis of biologically active molecules and allows for more efficient routes to therapeutic compounds. To this end, this method has been shown to be synthetically useful through incorporation into the synthesis of the natural product azaspirene. Azaspirene is a potential cancer treatment that has been previously shown to inhibit the formation of new blood vessels.

Extensive testing has been performed in order to determine viable substrates for this methodology. High yields have been achieved in all but the least reactive or sterically hindered substrates. In reactions involving an asymmetric starting material, this method has been shown to impart asymmetry into the final product, allowing for higher yields.

While investigating the nature of this reaction, it has been discovered that this methodology allows for the use of monosilyl zinc reagents which have previously been reported to have little reactivity. Monosilyl zinc reagents offer a potentially cheaper alternative to disilyl zinc reagents. Utilizing these reagents, studies into the nature of the mechanism have been performed. Additionally, research has been performed into optimizing reaction conditions for the use of monosilyl zinc reagents.

Session A-11

Poster Presentation: Engineering & Computer Science P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

154 9:00 am

Membrane Ultrafiltration For Water Treatment Anita Sanchez, environmental engineering (U)

Membrane ultrafiltration (UF) is on the rise in the water industry because it provides good removal of turbidity, particulates and organic matter. However, membrane fouling is still a limitation to wide usage of membranes. Fouling necessitates periodic chemical cleaning, reduces flux and in turn causes an increase in the amount of energy for operation, and the overall cost of operation. Dissolved organic matter (DOM) has been identified as one of the major causes of fouling in ultrafiltration. There is a need in the water industry to understand the changes in DOM due to fouling during membrane filtration. In this study, we are using a pilot scale UF membrane and synthetic wastewater as feed water to track the changes in DOM both in the permeate and backwash. The focus of this research is to monitor changes in the membrane flux, pressure, and DOC concentration. These measurements are critical and will help inform ongoing work in the Water Innovation and Reuse Laboratory to track membrane fouling. Preliminary results so far indicate that there is an increase in transmembrane pressure and a decrease in flux with fouling. No correlations were found between changes in DOC concentration and fouling which indicated that DOC measurements cannot be used for membrane fouling monitoring. The correlation between fouling and different components of organic matter is still weak and non-significant although the protein-like components of organic matter provide a better correlation than humic-like components.

155 9:00 am

Microbial Contributions to Organic Matter Optical Properties in Alvarado Creek During a Storm Event Lorelay Mendoza, Environmental Engineering (U)

Dissolved organic matter (DOM) is an energy source to support bacterial growth, and can influence biogeochemistry of a body of water. Increased bacterial growth is more prominent during storm events where urban runoff finds its way to creeks and streams and may ultimately result in water quality compliance failures. A portion of DOM is colored, called chromophoric organic matter (CDOM); these components have unique, fluorescent properties that facilitate their identification when they emit radiation in the ultraviolet and visible spectrum. Fluorescence has proven to be successful in discriminating between microbial and terrestrial sources of organic matter. Bacteria are known to autofluoresce and contribute fluorescent dissolved organic compounds to the water column as well. Therefore, we hypothesize that a positive correlation exists between bacteria counts and fluorescent DOM. We conducted stormwater sampling at Alvarado Creek on the SDSU campus and used heterotrophic count plates to measure aerobic bacteria. We compared bacterial numbers with a suite of fluorescent components and indices, including intensities of microbial fluorescent peaks. The data collected is essential in developing a better understanding of the relationship between flushing of watersheds, bacterial populations, including pathogenic bacteria, and their implications on public health.

156 9:00 am

Bench-Scale Evaluation of Solids Removal using Anaerobic Baffled Reactor

Theodore Mendoza, Environmental Engineering (U)

Clean water and sanitation issues are becoming of increasing concern in underdeveloped areas throughout the world. Anaerobic Baffled Reactors (ABR) hold promise to improve septic systems for treating wastewater. ABRs consist of a tank with compartmentalized hanging and standing baffles through which wastewater is treated by settling and anaerobic digestion. Alternating vertical motion throughout each compartment increases contact time in the sludge laver. This allows microorganisms within the sludge layer to more efficiently break down organic pollutants. ABR treatment systems are currently employed for domestic wastewater treatment in rural areas as well as informal urban settlements around the world. The ABR can be designed within shipping containers for quick installation while minimizing assembly and operational requirements. Research presented here evaluates the efficiency of a bench-scale ABR for total suspended solids (TSS) and volatile suspended solids (VSS) removal. TSS consist of organic debris, microbes, sand and sediment particles with diameters of two micrometers or larger. VSS consist of combustible suspended solids at 550 degrees Celsius. VSS measurements are typically used in order to determine organic concentrations. Measurements of TSS and VSS evaluate the efficiency of treatment units for domestic and industrial water supplies. For this study, fresh batches of synthetic wastewater were generated and fed to the ABR weekly. Periodic measurements for pH, conductivity, and dissolved oxygen (DO) in ABR influent and effluent were conducted to monitor stabilization of the anaerobic treatment process, which can take months. This research is necessary for understanding and improving the fundamental processes for an ABR treatment system. It has important implications for potential use in conjunction with wetland systems and irrigation water reuse.

157 9:00 am

Greener DEWATS: Duckweed as a Natural Polishing Step for Anaerobic Wastewater Treatment Plants Jesse Scolavino, Environmental Engineering (U)

Decentralized Wastewater Anaerobic Treatment Systems (DEWATS), such as the anaerobic baffled reactor (ABR), are increasingly being installed in rapidly growing urban areas, like South Africa, where the provisions of water and sanitation

services are challenging. The effluent from anaerobic systems tend to be rich in nitrogen and phosphorus, and recovery of these nutrients is an important goal for sustainable DEWATS. The purpose of this research was to evaluate the use of a floating aquatic angiosperm, such as duckweed, for nutrient recovery and further effluent polishing. A key step in this study was determining where the inclusion of duckweed would best serve the system to allow water to be discharged back into the environment without detrimental effects. Wastewater collected from different points in the DEWATS were made into dilutions from 100% to 25% wastewater (WW), and were inoculated with duckweed. The water was tested for phosphate, turbidity, chemical oxygen demand (COD), total solids and volatile solids over the retention time of two weeks. Daily measurements of pH, electrical conductivity, and temperature were made. Duckweed was harvested and measured for dry biomass. Plant uptake resulted in an average of 93% reduction in turbidity with average final values of 7.02 NTU for 100% WW. COD reduction was present in most cases, and total solids showed an overall trend of increasing while volatile solids showed that of decreasing. The overall results show that the inclusion of duckweed will improve the quality of treated wastewater and will allow further polishing of the quality of wastewater.

158 9:00 am

Application of Fluorescence Spectroscopy to Understand Change in Dissolved Organic Matter from Wastewater Treated in a Bench Scale Anaerobic Baffled Reactor

Chelsi Pascua, Environmental Engineering (U)

An anaerobic baffled reactor (ABR) is a wastewater treatment technology that is low cost, low energy due to anaerobic processes that do not require oxygen or mixing. The use of baffles in the tank forces flowing water under the sludge layer for treatment, allowing it to run without power. The sludge contains microorganisms that digest dissolved organic matter (DOM) as the synthetic wastewater also provides dissolved organic carbon (DOC) for the microorganisms to thrive. The ABR was started with brewery sludge and loaded with synthetic wastewater on a weekly basis. The ABR is beginning to be used for domestic wastewater because of its low cost, low energy use, thus, there is a need to understand the removal of DOM during the treatment as DOM becomes harmful at high levels of concentration. Such changes in DOM can be used to understand the appropriate retention time and the time it takes for the reactor to stabilize. Therefore, the aim of this study is to use fluorescence to understand the changes in DOM during the anaerobic treatment of synthetic wastewater. Fluorescence is the ability to measure light emitted by chromophores that absorb UV/visible light. It's used to track changes in large humic structures and smaller, microbially derived compounds included within colored dissolved organic matter (CDOM). This study uses a 3D bench top fluorometer and 1D in-situ fluorometer to understand the changes in DOM. The 1D in-situ is portable and produces real-time fluorescence data, that includes CDOM. The 3D bench top, however, provides similar data to the 1D in-situ

at a much higher precision, but is not transportable. This study will develop a relationship between the two fluorometers to accurately understand the 1D in-situ'slimitations. In addition, we are also monitoring DOC and chemical oxygen demand (COD) within the influent and effluent to ensure the ABR is functioning properly and to evaluate its performance. COD indicates the amount of oxygen consumed. Preliminary results indicate that there is substantial decrease in COD after approximately 72 hours of treatment. This study has important implications for treating domestic wastewater at a lower cost and energy.

159 9:00 am

Analysis of ABR Hydraulics Daniel Parsons, Environmental Engineering (M)

Decentralized wastewater treatment systems (DEWATS), such as the anaerobic baffled reactor (ABR), are increasingly being considered for implementation in rapidly growing urban areas where the provision of water and sanitation services is a challenge. This research analyzes the flow rate and flow distribution of an ABR treating wastewater from a community of 84 homes in Durban, South Africa. Effects of hydraulic behavior influence many aspects of water treatment systems, including hydraulic retention time, degree of mixing, and overall efficiency. An understanding of hydraulic behavior is necessary when describing treatment, providing context for research, and for providing accurate data for any future designs. Although fixed design parameters can be established, the ABR is a dynamic system with design parameters changing over time (i.e. hydraulic loading, temperature, and flow rate). Two important design parameters that require comprehensive knowledge of hydraulic behavior over time are flow distribution and hydraulic loading. Hourly flow rate data through the ABR was measured for 26 months, and was used to calculate the total volume flowing through the ABR each day. Analyses indicate that both flow rate and flow distribution have changed dramatically over the past two years. Trends for hydraulic loading rates (HLR) were calculated using the flow rate data. Total HLR of the system has seemingly gone through three distinct phases: the HLR was relatively stable for the first 9 months, followed by 10 months of significantly lower HLR, and lastly 7 months of HLR between the first two phases. The relationship between HLR and precipitation and temperature were also analyzed using data that was provided by the local weather station in Durban. Precipitation only had a significant impact on HLR if there was more than 50mm of rain in one day. Historically there has been little evidence of a correlation between HLR and temperature. However, this should be continuously monitored, because more recent data from the ABR in Durban may suggest a correlation. These hydraulic changes highlight how important context is when evaluating the system. Understanding how this system changes is vital to the improvement of future design and testing methods of ABR systems.

Session A-12

Poster Presentation: Physical & Mathematical Sciences P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

160 9:00 am

Theoretical Evaluation of the C4H3 Radical and Its Reactions with CO, HCN, O2, and C2H4 Jade Johnson, Chemistry (U)

The increased understanding of how intermediate hydrocarbons of incomplete combustion interact and form in engines has led to more efficient engine designs and a decrease in excessive pollution. This research begins to develop a kinetic model for the hydrocarbon free radical, C4H3, and its reaction with other combustion-related compounds including; CO, O2, HCN, and C2H4. Two different reaction sites on C4H3 are investigated in order to study how the relocalization of the electrons in C4H3 may affect its reaction kinetics. Previous kinetic models of complex systems assume the thermodynamically favored i-C4H3 radical (1-yne-3-ene) dominates the reaction. Given the comparable stability of the n-C4H3 radical (1,2,3-triene) and the high rates of combustion reactions, a closer examination is conducted comparing the transition states of the two isomers to determine any kinetically favored products. Transition states are calculated using the QST3(TS) method. Optimized geometries and frequencies were computed for each compound with the QCISD/cc-PVDZ level and basis.

161 9:00 am

Sensitive Detection and Separation of Nicotine and Cotinine by Laser Wave-Mixing Spectroscopy for Environmental and Biomedical Applications

Mya Brown, Chemistry (U)

Ultrasensitive detection methods for nicotine and its major metabolite, cotinine, are developed in order to provide reliable data that can help study first-, second- and third-hand smoke (FSH, SHS, THS) and their effects on non-smokers, especially children. To assess and understand the correlations of smoke exposure to smoke-related diseases, nicotine and cotinine are principle biomarkers used since most of the nicotine is metabolized to its main metabolite, cotinine. We demonstrate laser wave mixing as a highly sensitive nonlinear laser spectroscopic method. It is portable and compact, and hence, suitable for field use for a wide range of environmental and biomedical applications. In a typical laser wave-mixing setup, the laser beam is split into two input beams and then focused and mixed inside the sample cell. The signal is collected using a simple photodetector with an excellent signal-to-noise ratio (S/N). Wave mixing only requires a small amount of sample (nanogram), and hence, it can be conveniently interfaced to microarrays, microfluidics, chip-based capillary electrophoresis (CE) and other flow systems to yield excellent chemical

specificity and detection sensitivity levels (picomole or femtomole). Our results indicate that nicotine and cotinine can be detected and separated in their native form, label-free, using a 266 nm ultraviolet laser as well as their complexes obtained by using a two-reagent reaction when using a visible laser. The method could potentially allow reliable real-time detection of nicotine in indoor environments to accurately monitor smoke exposure to children. Moreover, measurement of cotinine in biological fluids would assist in understanding smoke-related diseases.

162 9:00 am

Sensitive and Selective Detection of Explosives by Nonlinear Optical Laser Wave-Mixing Spectroscopy Grant Varnau, Physics (U)

Nonlinear multi-photon laser wave-mixing spectroscopic method is demonstrated as an ultrasensitive detection method for explosives including ammonium nitrate, trinitrotoluene and triacetone triperoxide. These analytes can be detected based on direct optical absorption in their native form label-free using UV lasers or by using convenient visible lasers when combined with specific labels or agents. Wave mixing offers inherent advantages as compared to currently available methods including ion mobility spectrometers and mass spectrometers including a rugged, compact and portable design, excellent sensitivity and specificity levels, and standoff detection capability. Laser wave mixing is an unusually sensitive optical absorption-based detection method that offers significant inherent advantages including excellent sensitivity, small sample requirements, short optical path lengths, high spatial resolution, and high spectral resolution. Wave mixing allows for reliable monitoring of small changes in the analyte properties since the signal has a quadratic dependence on analyte concentration. The wave-mixing signal is a laser-like coherent beam, and hence, it can be collected with virtually 100% efficiency with excellent signal-to-noise ratio. The wave-mixing signal also has its own propagation direction and it can be spatially filtered and detected away from all the input beams. Laser excitation wavelengths can be tuned to detect multiple analytes in their native forms. We have detected ammonium nitrate. trinitrotoluene and triacetone triperoxide in different sample configurations (liquid, thin film, solid) and obtained excellent preliminary detection limits that are comparable or better than currently available detection methods while using a compact desian.

163 9:00 am

Application of Cation-Directed Catalysis Towards the Atroposelective Nucleophilic Kinetic Resolution of Promiscuous Pyrrolopyrimidine Kinase Inhibitors Joseph Mattocks, Chemistry (U)

Atropisomerism is a subtle form of chirality that occurs commonly in many important bio-active compounds. Molecules with rapidly interconverting atropisomeric axes are not obviously chiral yet they bind to the target active site in a single

atropisomeric conformation, with the non-relevant atropisomer contributing little to the desired activity. The undesired atropisomer may also lead to adverse side-effects, or can be significantly less biologically active, making enantioselective synthesis a necessary tool for research into kinase inhibition. It is a difficult and expensive process to obtain atropisomerically pure material with current technology. Reliance on semi-preparative chiral HPLC separation to obtain enantiopure materials limit the scalability and efficiency of our current syntheses. This bottleneck has hindered research into the biological effects of stable atropisomeric molecules. Herein we propose a new route towards the enantioselective synthesis of a pharmaceutically relevant class of atropisomers, pyrrolopyrimidines (PPY), via nucleophilic aromatic substitution (SNAr) on heterocyclic compounds. Different enantioenriched PPY scaffolds of both starting material and products were obtained via an atroposelective nucleophilic kinetic resolution (ANKR).

We have synthesized several PPY scaffolds to be evaluated for ANKR. Using methodology developed in the Gustafson Lab, we were able to rigidify the atropisomeric axes, resulting in products stable on the year timescale at physiological conditions. These atropisomeric scaffolds were subjected to our ANKR reaction, resulting in krel's greater than 30, a major breakthrough towards the scalable synthesis of atropisomerically pure kinase inhibitors. The data obtained from this study will allow for the efficient multi-gram synthesis of enantiopure kinase inhibitors. Highly selective inhibitors will be subjected to further biological studies to help elucidate unknown mechanistic pathways of kinases with highly conserved active sites.

164 9:00 am

The Electrochemistry of 1-Ferrocenyl-3-Phenylurea (FcUHH) in the Presence of the Diamide Guest, 1,4-dimethlpiperizine-2,3 dione (PZD)

Megan Jackson, Biochemistry (U)

Strength and directionality are the hallmark binding characteristics of molecules with multiple hydrogen bonds. When coupled to a redox center, oxidation or reduction can affect the electrostatic property of hydrogen bonds to allow for more control over this type of binding. In previous research a dimethylamino moiety was attached to one of the phenyl substituents of 1,3-diphenylurea, a good H-bond acceptor, to form a redox center. One electron oxidation of the resulting compound, 1-phenyl-3-(4-dimethylamino)phenyl urea (UHH) forms a radical cation, where delocalization of the positive charge could also strengthen hydrogen bonding to the urea N-H's, but upon a second electron transfer, the delocalization of two positive charges forms a very acidic NH site that could easily undergo proton transfer.

CV studies with UHH conducted in the presence of 1,4-dimethylpiperizine-2,3-dione (PZD), a good H donor, showed two, reversible oxidation waves shifting in the negative direction with increasing amounts of PZD, indicating an increase in binding strength. However, the current height of the second oxidation was comparatively smaller than the first and the wave became irreversible which could not be explained by hydrogen bonding only. CV investigations of UHH alone revealed that what was thought to be the first one electron transfer, was actually a complicated two electron, one proton transfer. The dimethylamino moiety on a fully reduced UHH is basic enough to remove a proton from another oxidized UHH allowing for an immediate second electron transfer at the same potential. While the presence of PZD evidently makes the first oxidation easier, it does not prevent the proton transfer and subsequent second electron transfer.

Our new strategy and the subject of this poster presentation, is the replacement of the phenylenediamine redox center with a ferrocene redox center (FcUHH). This change limits the oxidation to a single electron transfer process without a basic site for proton transfer. Initial CV experiments of FcUHH in methylene chloride show a reversible, one electron oxidation. With the addition of PZD, small negative shifts in the half wave potential are seen.

165 9:00 am

Fluorescence Sensing of Duplex DNA Formation by a Tricyclic Cytidine Analogue Kristine Claudine Teppang, Biochemistry (U)

Fluorescent nucleoside analogues function as valuable molecular probes in biochemistry and biophysics. With their resemblance to native counterparts, these analogues are utilized in photophysical studies to report a variety of properties such as detection of abasic sites and environmental changes. Contrary to many fluorescent nucleoside analogues available, tricyclic cytidine (tC,and tCO) derivatives maintain their brightness when incorporated into duplex DNA. Due to the need for a variety of molecular probes, the Purse lab is investigating the relationship between structural and photophysical properties of these derivatives to provide an expanded tool kit of fluorescent probes that can be matched to applications. Our group synthesized novel tricyclic cytosine derivatives by making chemical modifications to the tC and tCO scaffold and studied substituent effects on photophysical properties by means of fluorescence spectroscopy. By investigating their photophysical properties when incorporated into oligonucleotides, we can explore patterns for a systematic design of future fluorophores. We have recently synthesized an analogue for a fluorescence response to the formation of duplex DNA. Unique from our other analogues, 8-diethylamino tC (8-DEA-tC) becomes notably brighter once incorporated into double-stranded DNA. Quantum yield measurements of 8-DEA-tC show up to a twenty fold increase in quantum yield from nucleoside to duplex formation where base pairing protects the analogue from quenching by excited state proton transfer. Abasic and mismatch studies reveal that correct Watson-Crick base pairing is required and that the fluorescence turn-on effect is dependent on neighboring bases. Due to its ability to report on DNA duplex formation, we are investigating the analogue's use as a probe for enzymatic DNA synthesis.

Session A-13

Poster Presentation: Health Nutrition & Clinical Sciences P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

166 9:00 am

Imperial County Nurses Advancing Public Health Research in a Rural, Border Region Gina Bonilla, Nursing (U)

In Imperial County, there is a high prevalence of asthma among residents and few resources for management or prevention. Imperial County has a population of 186,744 with approximately 23,000 adults and children diagnosed with asthma. According to the California Accountable Communities for Health Initiative, further data is needed to measure the health in high asthma disparity region of Northern Imperial County that are not adequately represented in California Health Information Survey sampling.

UCLA partnered with Imperial County Public Health Department (ICPD) were assisted by SDSU-IV Nursing Leadership students to collect phone numbers from randomly selected addresses to participate in California Health Information Survey (CHIS). This survey collects data annually via telephone and provide key health information for researchers and public agencies.

In Northern Imperial County, will in-person recruiting conducted by local nurses, compared to mailing and cold-calling, increase California Health Interview Survey (CHIS) subject participation between October-December 2016?

Active participation of recruiters and encouragement of targeted population facilitates voluntary participation in survey. It was found that the physical presence of local registered nurses was successful in gaining the trust of residents. The SDSU nursing students were able to visit over 350 residences, donating approximately \$8000 in pro bono labor.

167 9:00 am

Empowering Nursing Confidence and Competence in CHF Patient Education

Lauren Wren, Nursing (U)

According to the Center for Disease Control (2016), 5.7 million adults are diagnosed with Congestive Heart Failure (CHF) in the United States (US) each year. Last year, California alone had 248,118 deaths due to heart disease and 59,832 who died of heart failure (CDPH, 2016). Heart failure costs the US 30.7 billion dollars each year (CDC, 2016). It is the most expensive chronic disease to treat. The purpose of this study is to find out the confidence and competence of nursing knowledge in CHF patient teaching in a rural hospital setting. The project will survey nurse's knowledge of CHF evidence based guidelines for care, confidence in providing CHF patient education, and availability of culturally appropriate CHF materials for patient use. The project is innovative in that it will be the second research project conducted by the newly established Pioneers Memorial Hospital (PMH) Interdisciplinary Research Council. PMH is a 107 bed, acute care facility located in Brawley, CA, which services the vast region of Imperial County. The hospital service extends to the northern communities around the Salton Sea, the southern border of Calexico and Mexicali, Mexico the west region of Ocotillo, and the east community of Winterhaven that borders Arizona.

168 9:00 am

Development of a Patient Navigation Intervention to Improve Colorectal Cancer Care Tatianna Clark, Kinesiology (U)

Purpose: Compared to non-Hispanic whites, Hispanics/ Latinos are at an increased risk for cancer disparities. This intervention development study outlines the creation of a patient navigation (PN) intervention designed to improve colorectal cancer (CRC) diagnostic care and screening at a Federally Qualified Health Center (FQHC). Methods: Evidence-based environmental and behavioral determinants from CRC literature and data from semi-structured interviews with staff (n=17) at a FQHC provided the needs and context for the intervention. Intervention Mapping (IM) steps 1-4, encompassing themes generated from the Social Ecological Model (SEM), were then used to develop an outcome-oriented intervention. Results: During step 1 of IM, researchers collected data from literature searches and interviews conducted with the FQHC's staff to identify the specific assets and barriers contributing to completion of recommended CRC screening and diagnostic care. In step 2, researchers created a logic model of the problem based on the SEM model; this model outlined the behavioral and environmental determinants and factors contributing to the health problem (premature death from CRC and poor health-related guality of life). Researchers then decided on specific behavioral and environmental outcomes for the intervention (e.g., completing diagnostic/ screening colonoscopy within 3 months of provider order [behavioral], and navigator explaining a health care provider's recommendation for screening/diagnostic colonoscopy in the patient's preferred language [environmental]). To accompany intervention outcomes, performance objectives describing how the outcomes could be accomplished were included. To complete steps 3-4, researchers are using the outcomes and performance objectives to create the program's structure, materials, and protocols using health behavior theory. Conclusion: This study describes the development of a CRC PN intervention for Hispanic/Latinos served by a FQHC that has the potential of lessening the CRC burden among this community.
169 9:00 am

Minding the Gap: A Study on Nurse Empowerment & Intention to Leave Anna-Maria Cunningham, Nursing Leadership in Health Care Systems (M)

The purpose of this quantitative prospective non-experimental cross-sectional study was to identify the relationship between currently working registered nurses' intention of leaving their organizations and the presence of structural empowerment in the form of Magnet Status. Registered nurse turnover for a large acute care hospital can cost up to 6.5 million dollars (Robert Wood Johnson Foundation, 2014). In this study, nurse turnover is defined as a nurse's intention to leave their organization. Magnet designated hospitals are known to have higher job satisfaction and increased nurse retention, as they provide the resources to engage in decisionmaking, offer nurse presence on committees, and support evidence-based practice (ANCC, 2016). These organizational resources are better known as structural empowerment and can result in an increase in nurses' perceived psychological empowerment (McCarthy & Freeman. 2008). Kanter's Theory of Structural Empowerment states that workers who are empowered are less likely to experience burnout and more likely to report job satisfaction (Kanter, 1977). Past studies have identified a lack of managerial support, inadequate staffing, and negative work environments as factors related to leaving (Park, S.H., Gass, S., & Boyle, D.K., 2016). However, limited studies have been conducted to determine a correlation between nurse turnover rates and the presence of structural empowerment (Park et al., 2016). Of an estimated convenience sample of 91 Registered Nurses (RN) from San Diego State University's RN-BSN and graduate programs, 40 survey responses were received. Structural empowerment was measured using data from the Conditions for Work Effectiveness Quality (CWEQII) tool. We hypothesize there will be a negative correlation between the presence of structural empowerment and nurse intention to leave their organization. Data collection is complete and data analysis is pending, but will be complete within a few weeks.

170 9:00 am

Differences in Sleep Deprivation among Undergraduate and Graduate Nursing Students Leslie Henricks, Nursing (M)

Background: Sleep is a basic human need vital for good health and well-being; being deprived of sleep has many consequences. Sleep deprivation (SD) is known as an acute or chronic condition that results from a lack of adequate or quality sleep during a time frame, which can cause a multitude of physiological and psychological effects. According to the NIH, SD is a common public health problem that affects people of all ages. Research studies have shown that sleep problems in students interfere with daily tasks. Although it is thought that students have a higher risk of SD, there is a dearth of research on undergraduate and graduate nursing students. Aim: The purpose of this study was to assess differences between graduate and undergraduate nursing students reported SD. A self-report survey, including the Pittsburg Sleep Quality Index was distributed to 91 students. The researchers hypothesize graduate students are at higher risk for sleep deprivation than undergraduate nursing students. Graduate students typically are working in their profession while juggling a heavy academic load and home life, therefore infringing on their time for sleep. The results of this study may provide information to develop targeted education for improved sleep practices among nursing students. The researchers believe this study sets the stage for an understanding of sleep deprivation among nursing students, and can positively impact their lives, as adequate sleep improves well-being. Methods: A nonprobability convenience sample (n =91) of undergraduate and graduate students in the School of Nursing was used to assess mean differences in sleep quality scores between undergraduate and graduate nursing students. Results: Research data have been collected and is pending analysis in the next few weeks.

Session A-14

Poster Presentation: Behavioral & Social Sciences P2 **Friday, March 3, 2017, 9:00 am** Location: Montezuma Hall

171 9:00 am

The Neural Underpinnings of Word Learning Errors: School-Aged Children with Typical and Atypical Language Jasmine Guantez, SLHS (U)

Jasmine Guantez, SLHS (U) Most children acquire language (

Most children acquire language quickly and with relative ease. There is a subset of children who develop language at a deviant rate compared to their peers, severe enough to be categorized as having a language impairment (LI). Children with Specific Language Impairment (SLI) show deficits in language abilities (e.g. vocabulary), but have normal cognitive abilities (e.g. IQ), while children with Nonspecific Language Impairment (NLI) have deficits in both language and cognitive abilities. The N400 ERP component is considered an index of lexical and semantic processing (Kutas & Federmeier, 2000) and has been shown to be sensitive to word learning in children and adults. The N400 amplitude attenuates with repeated exposure to a novel word in meaning-supportive contexts, indicating word learning in adults (e.g., Mestres-Misse et al., 2008). In this study, we compare the types of word learning errors made by children with LI to typically developing (TD) children. Both behavioral and EEG data collected during the task were compared across populations to provide further insight on word learning errors at a neural level. Participants in this study included monolingual English school-aged children. For this study, criteria for SLI and NLI followed the descriptions as specified above. Children in the LI groups had no identified causal factors for their low abilities (i.e., ADHD, ASD, etc.). All participants completed a word learning task while wearing an EEG cap in which they listened to sets of three sentences each ending with the novel

word. Sentence triplets comprised two conditions: Meaning (M+) and No Meaning (M-). In the M- condition, accuracy is dependent on the participant identifying that the novel word does not have meaning. However, if the participant establishes a meaning then we expect to see the N400 component attenuate, similar to what is observed in typical word learning. The discussion will focus on group differences in error types during the M- conditions and the correlation between the errors and the changes observed in the N400 component.

172 9:00 am

The Relationship of Code-Switching and Translation Equivalents, and How Does It Relate to Executive Functioning in Young Children?

Elizabeth Villanueva, Child and Family Development (U)

Research indicates that bilingual individuals activate both languages concurrently during speech such that they must inhibit one during comprehension and expression (Greenberg, Bellana, & Bialystok, 2013). In children with two languages from birth, practice with inhibition may be associated with enhanced executive function (EF), including executive control and selective attention (Bialystok, Craik, Klein, & Viswanathan, 2004). Bilingual children perform better in selective attention, task switching, conflict management, and cognitive flexibility tasks compared to monolingual children (Bialystok & Craik, 2010).

This study compares EF abilities in Spanish-English bilingual children to monolingual Spanish- and English-speaking children. We further investigate how code-switching (CS) and translation equivalents (TEs) in bilingual children relate to EF. CS is the combination of two different languages in speech production (Kharkhurin & Wei, 2014, p. 153). TEs are synonyms across languages (Bail, Morini, & Newman, 2015). We expect, due to the cognitive effort involved in inhibiting one language when speaking another, that children who know more TEs will perform better on EF (e.g., Crivello et al., 2016). On the contrary, we anticipate that CS does not reflect cognitive inhibition and therefore will not enhance EF.

Free play conversations between children and parents were analyzed for CS via language transcripts, TEs were recorded on the English and Spanish adaptations of the Peabody Picture Vocabulary Test. EF was measured with NIH Toolbox Flanker (Eriksen & Eriksen, 1974) and Dimensional Change Card Sort (DCCS; Zelazo, Frye, & Rapus, 1996) tasks.

Fifty-four English-speaking children (EP; 32 girls; Mage=37;24), twenty-six Spanish-speaking children (SP; 13 girls; Mage=38;12), and twenty-five Spanish-English bilingual children (BP; 8 girls; Mage=39;13) participated. We present preliminary descriptive data for participants who completed the Flanker (EP N=44; SP N=14; BP N=15) and DCCS (EP N=28; SP N=11; BP N=8) due to small sample size. Numerically, on both tasks BP outperformed EP and SP; however, 95% confidence intervals (CIs) overlapped. We present preliminary scatterplots examining the relationship between CS, TEs, and EF.

Numerically, bilingual children performed better in EF than monolingual children. However, we cannot yet conclude that bilingual, truly outperform monolingual, children. We will include additional bilingual children for the SRS meeting.

173 9:00 am

A Pilot Study of Compounding in Mexican Sign Language Hari Buenfil, Linguistics (U)

This investigation lays the foundation for a comprehensive study of Mexican Sign Language (LSM) compounds based on an analysis of word categories established by a native monolingual LSM signer. In keeping with the methods established in the literature, I compiled a sample lexicon consisting of 30 lexical entries and analyzed them using the sign language parameter of motion. Preliminary results support the existence of compounds, and of a compound creating mechanism, as 12 of the 30 entries analyzed successfully met the requirements for establishing a sign language compound.

174 9:00 am

Using Microsoft KINECT to Investigate the Movement Properties of Signs in American Sign Language (ASL)

Ryan Edinger, Mechanical Engineering (U)

Movement is an important parameter of ASL signs, however, the specific movement patterns across the ASL lexicon remain relatively underexplored. This project aims to collect hand motion data from signers when they name pictures in ASL. Specifically, the movement properties of signs are analyzed using a non-invasive motion capture system that employs Microsoft KINECT. With the KINECT system, hand movements can be unobtrusively tracked and various articulatory measures can be obtained, such as distance travelled by the hand(s), joint locations, the size of articulatory space, and velocity. This system has been previously used to investigate gestures produced by hearing non-signers. Using motion capture, this project aims to answer the following questions about the phonological / phonetic properties of sign movement: is there a systematic movement distinction between nouns and verbs across ASL lexicon? What is the impact of lexical frequency on sign movement? In a picture-naming experiment, 25 deaf ASL signers name a set of 500 pictures (250 objects and 250 actions, Ofrom Bates et al., 2007), Reaction times are recorded by key-release, and KINECT data is recorded simultaneously. The KINECT device is discretely mounted on a tripod behind the computer and records the X,Y,Z coordinates of the signers' joints in real-time. It is equipped with a hi-resolution camera that records basic RGB video along with visual depth recording. Preliminary data from four deaf ASL signers will be presented using 3D visualization tools. The study tests the following predictions: 1) verbs tend to contain single, continuous movements that are larger than the movements of nouns and 2) higher frequency signs have shorter movements than lower frequency signs, as has been previously shown for spoken words. The Kinect system provides an optimal noninvasive tool that allows us to investigate how different linguistic factors influence sign movement.

175 9:00 am

Specific Purpose English Communication System for Seniors: A Follow-Up Study with Native Speakers of Somali

Sim Quinzon, Speech-Language Pathology (M)

The Specific Purpose English Communication System for Seniors (SPECSS) was designed to teach seniors environmentally-relevant communication skills. This study was implemented at Somali Family Service (SFS) in San Diego. It has been shown that non-native English speakers often encounter obstacles that hinder or prevent access to healthcare, (Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003) which can be attenuated by reducing language barriers. Language proficiency and perception may also precipitate a number of negative attitudes and stereotypes about non-dominant groups (Scassa, 1994).

A previous pilot study of 9 participants (aged 60-78) using SPECSS was conducted at the Gary and Mary West Senior Wellness Center in downtown San Diego. Participants who significantly improved averaged a 42.4% increase in knowledge (SD = 26.9). Results indicated participants with the lowest English proficiency levels benefitted the most from the program (Hay, Jacobson, Alsol, Quinzon, Trapote, Causor, Luoh, Blumenfeld, 2015). The purpose of the present study was to replicate and expand on the findings of the pilot study and continue developing an effective curriculum for teaching seniors functional English skills.

The present study reports data from native Somali speakers across 11 ESL classes (n=10, aged 58-82). Participants had an overall lower English proficiency level than those in the pilot study. Participants' knowledge of 346 functional English-language items were assessed before and after the 11-week period and were categorized as one of the following: Not known before and after, not known before but knew after, knew before and not after, and knew before and after. Nonparametric analyses are being used to examine the significance of any positive gains. Also, participants' ability to learn the curriculum may have been influenced by individual factors such as baseline cognition, baseline English proficiency, and amount of exposure to English. Creating programs for adult language learners is essential for maximizing their ability to independently and successfully function in a majority English-speaking environment and the results of the present study will allow further development of one such curriculum aimed at aiding any senior English language learning population.

176 9:00 am

Voice Onset Time of Voiceless Plosives by English Monolingual Speakers

Kiara Caber, Speech, Language, and Hearing Sciences (M)

This study evaluated whether English monolinguals showed productive knowledge of phonetic differences between sounds that occur in both English and Spanish. This was examined by measuring Voice Onset Time (VOT) to see if participants changed their pronunciation of Spanish words involving voiceless plosives /p t k/. In Spanish, there are shorter VOT values for voiceless plosives /p t k/ than in English. In English, there is an aspiration rule that occurs when voiceless plosives are in a word-initial or stressed syllable position (Klatt, 1975). In Spanish, this aspiration rule does not exist. This reduced aspiration results in a smaller VOT value in Spanish than in English (Flege, 1991).

Data from this study were used to answer two research questions. Primarily, will monolingual English speakers alter their pronunciations of voiceless plosives /p t k/ in Spanish words due to living in a Spanish-English bilingual community? Secondarily, in which contexts will the pronunciations show greater variation? We hypothesized that participants would produce /p t k/ in Spanish with shorter VOT values than in English. We anticipated that the English aspiration rule would carry-over to their pronunciation of Spanish words.

Twenty adult Southern California residents speaking a Southern California dialect of English were recorded reading English and Spanish probe lists containing prevocalic /p/, /t/, and /k/. These were repeated three times each in the carrier phrase "say _____ again" in both languages. The recordings were acoustically analyzed using Praat to determine VOT lengths. There was an initial analysis and reliability check for accuracy. VOT values were compared between languages and contexts.

Results showed there was a main effect for phoneme, language, and context (p<0.01). For each phoneme /p/, /t/, and /k/, there were trends in VOT values for both languages and contexts. A significant difference between phoneme production word-initially in both languages was exhibited by lower VOT values in Spanish. Regarding context, there was a greater margin between VOT values when the phoneme was produced word-initially than following an /s/ in English than Spanish.

Session A-15

Poster Presentation: Business, Economics & Public Administration P1 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

177 9:00 am

Embodying Dance: How to Build Authentic Marketers

Martha Brosnan, Marketing and Dance (U)

My first two years at SDSU I studied two majors (Marketing and Dance) that never coincided. I moved and talked through dance rehearsals and then changed my clothes to present a marketing plan. Over the next few years, I noticed the skills I embodied in dance classes supported me in marketing classes. My hypothesis states that my majors are connected, and dance has transferable skills that are valuable to marketers.

My research acknowledges the negative stereotypes surrounding dance at the university level; claiming dance is "easier" than

other majors, therefore not as academic or challenging. As an ambassador of both dance and marketing, I aim to illuminate the value of dance as a practice to build better marketers.

In an internship over the summer with professor Jess Humphrey of the Dance Division in the School of Music and Dance, I defined specific skills as a Student Research Assistant. In this internship, we studied concepts (by moving, talking, and writing) of a new class created by professors Humphrey and Leslie Seiters called Dancemaking. We then used this research to make a 10-minute dance called "Follow Us Here" for Jean Isaacs'/San Diego Dance Theater's Trolley Dances. We built an open and mindful environment where I embodied different skills in response to my hypotheses, to then remember where I also used the same skills in marketing classes.

Through movement and analysis I clarified these five transferable skills: The unknown is your friend. Incorporate rigor and openness to find strength in risk. Life is a lab. Every moment is an opportunity to try new ideas and refine old ones. Me, you, us? Success. Understand my individual value to motivate and cultivate successful group environments. Be a visionary with a microscope. Incorporating multifocal thinking to target both small details and the big picture. People are transparent. On the spot critical analysis of body language and verbal cues to build a rapid response.

As a December graduate at SRS, I will convince marketers to step into their nearest modern dance class to better their career and experience the value of dance.

178 9:00 am

Hortalizas Figueroa: Date Fruit Production and Distribution Analysis

Ana Figueroaana, Marketing (U)

Hortalizas Figueroa, a company in the agriculture business for fourteen years, is located in Mexicali and is committed to the production of different fruits and vegetables. The company is committed to offering quality over quantity to their customers, which are distributors with headquarters in the United States and sell to other businesses, such as Cheesecake Factory. Although the leader of the company has been in the business for over 30 years and successfully run the company for fourteen years, he has never ventured to distribute his products under his own label. Currently, the company has a new project on hand that centers the date fruit as a new product to offer to distributors or direct customers. However, the owner of the company, Hector Figueroa, has accumulated enough capital to start his own label. This paper will be analyzing the factors that are part of this new agriculture and business project in order to analyze the different paths the company can take with this new product. Some of the choices the company has are to find a distributor that wants to buy the product, but packs the product under its own label, or to analyze the different channels and procedures Hortalizas Figueroa needs to fulfilled in order to sell the product under Hortalizas Figueroa label. We will be analyzing Hortalizas Figueroa's background story, planting

requirements to export to U.S., preparation and cleaning of product, export requirements to U.S., support from Mexico's government, sales, and date fruit farmers in California and Baja California Mexico, and associations related to the product. This paper will analyze such factors by doing primary research, such as interviews, and secondary research. The suggested hypothesis is that Hector Figueroa might sell to a distributor or another farmer who is looking to fulfill its own demand. Hector Figueroa needs to learn from distributors whom have the contacts or have been in the business of date fruit production for years. By taking this path, the company might be able to learn and survive in the future while in the present the company accumulates capital.

179 9:00 am

Is there a relationship between Job Satisfaction and Union Environments?

Jeffrey Trageser, Nursing Leadership (M)

Problem/Background: Approximately 25% of newly graduated registered nurses leave their first job within two years (Djukic, Pellico, Kovner, & Brewer, 2011). The hiring and training of nurses costs the average health care provider \$300,000 annually for every 1% increase in turnover (Jones, 2008). Job satisfaction is the primary factor cited by registered nurses who are seeking a new employer (Seago, Spetz, Ash, Herrera, & Keane 2011). Improved job satisfaction for registered nurses can decrease organizational turnover (Liu, Aungsuroch, & Yunibhand, 2016). Unions claim that they are beneficial for nurses (i.e., improve benefits and advocate for patients); however, studies show conflicting information on the effect of unions on nurse job satisfaction ("Join UNAC/UHCP", n.d.; Friedrich, 2001; Hayes, Bonner, & Pryor, 2010; Pittman, 2007).

Aim: The aim of this study is to identify the relationship between registered nurses' job satisfaction in a non-union or union represented organization by incorporating theoretical frameworks from Maslow's hierarchy-of-needs theory and Herzberg's two-factor theory. These two theories suggest a way to examine how an employee identifies their motives and needs (Liu et al., 2016).

Methods: This study is a prospective non-experimental correlational study using a convenient sample of experienced registered nursing students from SDSU. Job satisfaction was measured using McCloskey/Mueller Satisfaction Scale. We evaluated the opinions from SDSU RN-BSN and SDSU MSN students through emails that linked the students to an online survey using SurveyMonkey Select. The data have been collected and will be analyzed utilizing SPSS Statistics Package 23.0 in two weeks, therefore the results are pending.

Session A-16

Poster Presentation: Engineering & Computer Science P2 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

180 9:00 am

Optimal electrode selection for damage identification in Carbon Fiber Reinforced Polymer Composites using Electrical Resistance Tomography

Luis Waldo Escalona-Galvis, Computational Science (D)

Damage modes in laminated fiber reinforced composites include intralaminar matrix cracking, interlaminar delamination and fiber failure. Identifying and quantifying the extent of damage during service is paramount to the safe operation of these structures. Electrical Resistance Tomography (ERT) is being used as non-destructive evaluation (NDE) technique to assess internal damage in Carbon Fiber Reinforced Polymer (CFRP) composite structures. The ERT technique uses the inherent electrical properties of CFRP for the sensing and characterization of internal damage state in composites with conductive fibers. Sensing delamination and matrix cracking are particularly challenging as they have to rely on the transverse to fiber direction conductivity, which is one to two orders of magnitude lower than the fiber direction electrical conductivity.

This work investigated optimum selection of sensing configurations for delamination detection using ERT in thick cross-ply laminates. The use of an effective independence (EI) measure originally proposed for sensor location optimization in experimental vibration modal analysis is explored. The El measure is applied for selecting the minimum set of resistance measurements obtained from all the possible electrode combinations used in the excitation of the laminate. A spectral representation of the resistance measurements in the laminate obtained after applying Singular Value Decomposition (SVD) is used for the implementation of the EI based reduction. The electric potential field in the CFRP laminates is computed numerically by finite element models considering different layouts under delamination damage with specified sizes and locations. The effectiveness of the EI based reduction in electrode combinations reduction is assessed by comparing the results of inverse identification of damage using the full set to the reduced set of resistance change measurements.

This work demonstrated that the EI measure is effective for the optimal selection of electrode pairs needed for damage identification using ERT on CFRP composite laminates.

181 9:00 am

Evaluation of Vacuum Assisted Resin Injection Repair Protocol for Composite Materials Alexandra Mallory, Aerospace Engineering (U)

Laminated composite structures offer advantages of higher specific strength and stiffness compared to metals and therefore increasingly used in design of primary aircraft structures. Laminated composites are prone to delamination when subjected to impact damage. Current industry practice is to fill the delamination crack sites with resin to prevent moisture and contaminants from entering the damaged zone and causing further damage

These resin injection repairs are not considered a structural repair and the estimates of the load carrying capacity and life of the component after damage does not consider the repair. This is due to concerns about quality of repair and the strength of the adhesive bonding due to environmental contamination of the repair surfaces. Recent research suggests that delaminated composites can be repaired using resin injection, and recover most of the original strength. However, there is no accepted or standard protocol for the creation of controlled damage, the injection repair procedure, and assessment of the post repair strength.

This project reviewed existing literature to document different methods used to create delamination, injection repair procedures, and tests used to assess post-repair strengths. was aimed at developing a repair procedure for resin injection repair and assessing post-repair strength of the composite laminate. Controlled circular delamination was induced using a modified hole plated shear test. The induced delamination was repaired using an injection repair technique adopted from literature with some modifications. Injection repairs were performed in specimens with and without additional drilled vent holes. Repaired specimens were then tested using the same procedure used to induce the original delamination. The load displacement response, the peak load are compared for pristine and repaired laminates. The tested specimens were sectioned and imaged using optical microscopy to visualize the damage in post repair tests. Finite element analyses were conducted to analyze the indentation processes in pristine and repaired configurations to interpret the experimental results.

182 9:00 am

Electrode design for Measuring Circular Delaminations Using Electrical Resistance Tomography

Adrian Rivera, Aerospace Engineering (U)

In recent years, aerospace industry has significantly increased the use of Carbon Fiber Reinforced Polymer (CFRP) materials in flight critical structures due to their high specific strength and stiffness. CFRP laminates are prone to delamination cracking when subjected to impact or concentrated loads, such as those at fastener sites. Understanding initiation and growth of delamination

in composites is important to assess structural integrity. Current research in this area is aimed at developing models for progressive failure of composites and validation of these models in experiments. Delamination damage measurements using currently available non-destructive evaluation (NDE) techniques such as ultrasonic C-scans, X-ray imaging, thermography, or acoustic imaging require extensive instrumentation and removal of test specimen from test frame. There is a need for an in-situ NDE technique that minimizes the interruption of the tests for imaging the damage. Electrical Resistance Tomography (ERT) has been investigated as a NDE technique for damage identification in CFRP laminates and has the potential to do in-situ measurements. ERT measures the electrical properties of CFRP materials to detect and quantify the internal damage.

The present work investigates the design of ERT electrodes intended for in-situ delamination growth detection during indentation tests. The goal of this study is to design a concentric ring electrode system for detecting and accurately measuring circular delaminations. Finite element analysis models are used to assess the measurement resolution and accuracy of different electrode design and choose an optimum configuration. A 3D finite element model of a [04/904] laminate with an embedded circular delamination on the midplane is used for the study. The design uses three circular ring electrodes on the top surface of the laminate and four electrodes on the bottom surface. The finite element analysis using ANSYS® software is used to calculate the voltage potential at different combinations of electrode pairs, for different delamination sizes. The obtained results will help identify the optimum electrode sensor configuration.

183 9:00 am

Predicting Degradation and Failure of Composites under Fatigue Loads Using a Micromechanics Model

Lauren Parrett, Aerospace Engineering (M)

Carbon fiber reinforced polymeric composite materials are increasingly used in primary aircraft structures. Safely operating these structures requires capabilities to predict the degradation of properties under repeated cyclic (fatigue) loads and estimating remaining useful life of a structure given its history of operation.

Models for fatigue predictions include empirical models, damage mechanics models and micromechanics based models. Damage mechanics and empirical models predict the effect of load cycles on the degradation of stiffness and strength properties of composites. Traditional empirical approaches that were developed originally for metals and were extended to describing mesoscale (ply level) fatigue response of composites. These models have poor accuracy and often require a large number of calibration tests.

The heterogeneous nature of the composite material introduces many different failure modes. Failure mechanisms in laminated composites include interlaminar modes of failure such as: matrix cracking, fiber matrix interface failure, fiber failure, and interlaminar mode of delamination. Accumulation of damage in the above modes leads to ultimate failure. Micromechanics models capture the response of the constituents (fiber, matrix, and interface) and use homogenization approaches to provide mesoscale scale (ply level) properties. These models have higher fidelity in representing the damage mechanisms and can therefore provide more accurate life estimations. However, the constituent properties needed cannot be directly measured and have to be indirectly identified from structural scale (coupon) tests. The long terms goal for this research is to identify the optimal set of tests (laminates and loads) needed to most accurately quantify the micromechanics model parameters.

In this presentation the results of the preliminary work done in simulating fatigue response of composite laminates using a micromechanics code (MAC/GMC) developed at NASA and the sensitivity of estimated life to parameters in the model is presented.

184 9:00 am

Implementation of Directional MAC Scheme for Multi-Beam Antennas in Riverbed Modeler Nandini Venkatraman, Electrical and Computer Engineering (M)

The proliferation of mobile users and the increased use of the multimedia applications over wireless has caused the well-known and the intensely-researched problem of spectrum crunch. Existing network infrastructure can not support these application data demands. The transport of this exponentially increasing amount of data in a timely and secure manner, without compromising the quality of service and user experience, is a big challenge for researchers in wireless communication and networks. Major research groups, government agencies, and corporations are investigating significant resources for addressing this issue. Qualcomm has termed this as the "1000X" challenge to represent the 1000 fold increase in wireless network data rates needed in near future.

Recently, the use of directional antennas (e.g., the multi-beam smart antennas (MBSA) which allow the spatial reuse and interference mitigation has been investigated for alleviating the spectrum crunch. Using 'm' beams in MBSA, m users can be simultaneously supported by a node in wireless networks, as opposed to only one user in existing omni-directional antenna based schemes. This can increase the spectrum efficiency by up to m times.

In this research, we propose a novel, medium access control protocol (MAC) based on the use of MBSA in wireless nodes. This abstract is mainly focused on enhancements done at the Physical and MAC layers to support the simultaneous data transport of multiple users by taking advantage of MBSAs. We have implemented a directional MAC scheme in the Riverbed wireless modeler, which is a widely-used discrete event network simulator software. Note that the Riverbed modeler has implemented the physical and MAC layer protocols only for the omni-directional protocols. We have made significant changes in this modeler to incorporate the use of MBSA and new MAC layer protocols.

Session A-17

Poster Presentation: Health Nutrition & Clinical Sciences P2 Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

185 9:00 am

Does Maximal Isokinetic Power at Exercise Intolerance Approximate Critical Power? Stanley Yong, Kinesiology (U)

Tolerance to high-intensity exercise is described by a hyperbolic power-tolerable duration (P-t_{LIM}) relationship. The asymptote of the P-t_{LIM} relationship, termed critical power, demarcates sustainable from non-sustainable exercise. However, characterizing this relationship is time consuming - typically 4 constant power exercise tests to intolerance are required. Alternatively, at the limit of tolerance to supra-critical power exercise, a 3 min all-out sprint approximates critical power (Murgatroyd et al., Eur J Appl Physiol 114:1863-74, 2014). We aimed to determine whether maximal isokinetic power (30 s in duration) measured immediately at the limit of tolerance approximates critical power. Ten participants (3 females, 7 males, 22±2 yr, 73±11 kg, VO_{2peak} 3.62±0.87 L.min⁻¹) completed constant supra-critical power exercise tests to intolerance, immediately followed by a maximal isokinetic effort at 80 rpm for 30 s. Mean isokinetic power over the final 20 s was compared to the critical power asymptote determined from four variable-duration constant power tests to intolerance. Mean bias and limits of agreement were calculated using the method of Bland & Altman. Critical power estimated from the P-t_{IIM} relationship was 165±54 W with 95% confidence interval of 157, 172 W. Of the four constant power tests used to define P-t_{LM}, isokinetic power was not different to critical power only following the longest duration trial (p>0.05, 186±65 vs 165±54 W). However, mean bias and limits of agreement were 21 W and ±88 W, respectively. In the remaining trials, isokinetic power immediately following the limit of tolerance was greater than critical power (p<0.05). Isokinetic power measured immediately following the limit of tolerance consistently overestimated critical power. While not different to critical power, the closest estimation showed more than 20 W bias with limits of agreement nearly 12 times the span of the 95% confidence interval. Thus, brief maximal isokinetic power (30 s) immediately following the limit of tolerance does not approximate critical power.

186 9:00 am

Acute Effects of Sitting Interruption Modalities on Plasma Glucose in Postmenopausal Women Sabrina Aden, Biology (U)

Sedentary behavior is associated with aging-related health risks and all-cause mortality. Older adults typically sit for 60% or more of their waking hours. Older women significantly out-number men in later life and disproportionately account for health care costs. Sedentary behavior is a significant public health concern for aging women. Effective, health-promoting sitting interruptions have not been characterized in older adults. We assessed postprandial glucose metabolism effects of 3 different sitting interruption modalities compared to a control, prolonged sitting condition. The interruption modalities included frequent sit-to-stand transitions (2-minute standing breaks each 20 minutes), brief walking breaks (2-minute walking each hour), and hourly 10-minute standing breaks. We enrolled 10 overweight/obese postmenopausal women in a randomized, 4-arm, 4-period crossover pilot study. During each 6-hour sitting condition, participants consumed a breakfast and lunch meal. Blood samples were collected every 30 minutes and glucose concentration was measured in isolated plasma. In all 3 sitting interruption conditions, the average postprandial plasma glucose concentration across the post-lunch period was significantly lower than across the post-breakfast period (p<0.05). These period-specific differences were not observed in the control condition. The 2-min stand every 20 min condition resulted in significantly lowering post-lunch glucose compared to the control condition (p<0.05). To conclude, the results suggest that the sitting interruption methods employed in this study need to be practiced regularly throughout the day in order to achieve health benefits of improved postprandial glucose response in older adults. Our findings warrant additional, properly-powered studies to examine the metabolic benefits of these sitting interruption modalities.

187 9:00 am

The Effects of Feedback Type on Motor Learning of a Novel Swing Phase Trajectory Edgar Ramirez, Biology-Bioengineering (U)

Background: Robot-assisted therapy can improve gait function in patients with motor disorders. It is not clear how we can use these robotic devices to maximize motor learning and functional outcomes. The Ekso is a commercially available wearable robotic exoskeleton used for gait rehabilitation after neurological injury. The apparatus enables individuals with lower extremity weakness or paralysis to stand and walk over ground with a full weight bearing gait and has variable assistance modes (Adaptive and Fixed) to help improve engagement and effort of the user. Purpose/Hypothesis: The purpose of this study was to compare if continuous feedback (Fixed mode: if the subject is not following the trajectory, then the movement briefly stops and an audio signal is given) or intermittent feedback (Adaptive mode: subjects receive a score on how well they followed the trajectory intermittently without interruption of the movement) is better for motor learning of a novel walking trajectory in able-bodied subjects. We hypothesized that subjects trained in the Fixed mode would learn the trajectory faster during training, but subjects that trained in the Adaptive mode would better retain learning of the trajectory.

Methods: 9 able-bodied subjects were randomly assigned to either the Adaptive or Fixed mode. Participants were given instructions to learn a novel swing phase trajectory in their assigned mode while walked in a linear path (18 m in length) 10 times. Performance measures included the time to learn the novel trajectory. Subjects were tested on a second day (24-48 hours later) to assess retention of learning. We also measured electromyography (EMG) in 8 lower leg muscles in the right leg.

Preliminary Results and Conclusions: Preliminary results show the Adaptive group took more time to learn the novel trajectory (5.25 laps) compared to the Fixed group (4.25 laps). During the retention trial, the Adaptive group was able to walk without errors, while some subjects in the Fixed group still experienced errors, supporting our hypothesis. Results from this study will inform how best to use these wearable robots to maximize function and ultimately health in individuals with neurological injury.

188 9:00 am

Spine Motion Monitor: Validation of a Device for Daily Monitoring of 3D Lumbar Spine Posture and Movement

Katy Schneider, Kinesiology Pre-Physical Therapy (U)

Purpose: Prior investigators have designed sensors for portable tracking of lumbar spine posture and movement, but existing devices have limitations such as excessive size and limited battery life. The spine motion monitor (SMM) is a new low-profile sensor system that allows for up to 14 hours of wireless tracking of lumbar spine posture and movement outside the laboratory. The purpose of this study is to validate measurements from the SMM using a gold standard, 3D motion capture system.

Methods: Seventeen healthy subjects (22.5 \pm 2.3 years; 9M, 8F), without a history of low back pain, were tested in a laboratory setting. Each subject completed a series of static postures and dynamic movements of the lumbar spine, including: flexion, extension, side bend, and rotation in both sitting and standing positions. Lumbar spine kinematics were captured simultaneously with the 3D motion capture and SMM systems. The SMM data was compared to the 3D motion capture data to determine the differences between measurement systems (ANOVA) and the relationship between measurements (R2) with each system.

Results: The SMM measurements were significantly, but consistently lower than 3D motion capture measurements in the sagittal and frontal planes (P<.01). There were no significant differences between measurements in the axial plane (P>.05). Relationships between measurements with the two systems were greatest in the sagittal (R2=0.75-0.93) and frontal (R2=0.37-0.61) planes. Axial plane measurements between systems were not related (R2=0.00-0.13), which is consistent with the prior literature on these types of devices. Further, the SMM was more accurate for measuring seated movements than standing movements, and during static tasks than dynamic tasks.

Conclusion: This technology can be used to accurately measure some directions of lumbar spine posture and movement during a person's daily activities. This information can be used to identify which movements and postures may be related to a low back pain problem in order to guide treatments. More device development is needed to improve accuracy of the device for frontal and axial plane measurements.

189 9:00 am

Dynamics of locomotor Fatigue During Supra-critical Power Exercise in Humans Austin Swisher, Kinesiology (U)

At the limit of tolerance to ramp-incremental exercise, maximal voluntary isokinetic power is not different to the power required by the task in endurance-trained athletes. This is consistent with the physiologic limits for power production having been attained at the limit of ramp-incremental exercise. The dynamics of the decline in locomotor power, and whether the physiologic limits are similarly attained during constant-power cycling are unknown. We aimed to measure 1) the dynamics of locomotor fatigue during constant supra-critical power cycling, and 2) the magnitude of any reserve in locomotor power immediately at the tolerable limit of both constant and ramp-incremental cycling in recreationally active volunteers.

Fifteen participants (7 females, 22 ± 3 yr) completed ramp-incremental and constant power (205 ± 46 W) exercise to the limit of tolerance. Immediately following intolerance, participants completed a short (<5 s) maximal isokinetic effort at 70 rpm. The time course of locomotor fatigue during constant supra-critical power exercise was characterized using short maximal isokinetic sprints interleaved during exercise.

Constant power exercise duration was 312 ± 37 s. Isokinetic power production at 30, 60, 120, 180 s and the limit of tolerance was 609 ± 165 , 503 ± 195 , 443 ± 157 , 449 ± 133 , and 337 ± 94 W, respectively. Of the total decline in isokinetic power, ~50% occurred within the first minute of exercise and reductions (p< 0.05) in isokinetic power occurred at all time-points vs the

baseline maximal isokinetic power (666 \pm 158 W). Additionally, a power reserve of 132 \pm 74 (64 % of the task requirement) and 119 \pm 80 W (47 %) was present at the limit of constant power and ramp- incremental exercise.

Locomotor fatigue occurred rapidly during supra-critical power exercise with pseudo-exponential kinetics. The dynamics of locomotor fatigue were similar to the dynamics reported for primary fatigue-related intramuscular metabolites, suggesting a link between the intramuscular milieu and voluntary muscle power. Instantaneous isokinetic power production at the limit of tolerance exceeded that of the task requirement, regardless of the work rate profile. Thus, the perceptual and physiologic limits were dissociated at the limit of tolerance in recreationally active volunteers.

190 9:00 am

The Effect of Moderate Intesity Stair Climbing on Postprandial Blood Glucose Tolerance

Kathryn Ward, Exercise Physiology and Nutritional Science (M)

Introduction: Blood sugar (glucose) increases after meal consumption and with a higher glucose response there is an increased risk of developing metabolic complications. The rise in glucose and associated rise in inflammatory/oxidative stress can be regulated with short, low-moderate intensity exercise. The purpose of the present study was to investigate moderate intensity stair climbing of various durations following consumption of a dextrose solution in healthy men and women.

Methods: Eight participants (5 male, 3 female) initially completed a maximal aerobic capacity (VO₂max) test and oral glucose tolerance test without exercise (OGTT). Additional OGTTs were conducted for the ten-minute (C10), three-minute (C3), and one-minute (C1) bout trials, each ending just before the thirty-minute point after glucose consumption. Finger stick blood glucose measurements were taken every fifteen minutes for one hour while venipuncture blood draws were taken at baseline and thirty minutes after consumption.

Results: Blood glucose concentration at thirty minutes (F3) were significantly lower for C10 compared to C3 (p<.003) and C0 (p<.004). The greatest significant differences in blood glucose concentrations were found between baseline (F1) and F3 (p<.001,), indicating the peak in glucose concentration occurred thirty minutes after glucose consumption. Mean VO₂ values during each bout were 43.96% of max for C1, 58.07% for C3, and 60.36% for C10, while the average RPE for each trial was found to be between 2.9 and 3.3. C10 was determined to have a significantly lower incremental area under the curve (IAUC) compared to the control (p<.002; 28.8%).

Discussion: The present study further provides evidence that moderate intensity stair climbing can lower peak glucose concentration. The findings suggest that ten minutes of moderate intensity stair climbing has the most significant effect on peak blood glucose measurements.



Abstracts of Presentations

Session B



Session B-1

Oral Presentation: Physical & Mathematical OR2 Friday, March 3, 2017, 11:00 am Location: Pride Suite

191 11:00 am

Mechanisms Affecting the Glass Transition Temperature of Thin Polystyrene Films Gerardo Mendoza, Astronomy (U)

The glass transition in free-standing films of linear and cyclic polystyrene (PS) was studied to better understand the experimentally found relationship between the glass transition temperature (T_a) and film thickness. United-atom molecular-dynamic simulations were performed on free-standing films of varying thicknesses. Data confirmed the positive correlation between T_a and film thickness, i.e. T_a decreases as film thickness decreases. At 20 nm the difference is less than 1%, while at 2.5 nm the difference is 13% for linear and 9% for cyclic chains. Recent studies show that a larger number of end groups inhabit the interfacial layer rather than the middle of the film and that a deficit of phenyl groups exists in the interfacial film layers nearly 1 nm below the surface. The large number of end groups would increase interfacial layer mobility while the deficit of phenyl groups would weaken the phenyl-phenyl aromatic (π - π) interaction which would lead to a lower T_a in thin films. The cyclic polystyrene chains lack end groups but have an observed deficit of phenyl rings comparable to that in linear polymers. Therefore, the chain ends alone cannot be the only cause for the observed T_a dependence on the thickness of thin PS films. The π - π interaction seems to be an important cause as well.

192 11:15 am

Ab Initio Calculations of Rotating Medium-Mass Nuclei

Miguel Godinez, Physics (U)

We now have high precision descriptions of the nuclear force which accurately reproduce nuclear properties, such as excitation energies, for light nuclei. Numerically exact solutions for medium to heavy nuclei with "ab initio" forces, however, are still computationally prohibitive. Given this difficulty, I investigate whether one can instead reliably use "ab initio" (fundamental) nuclear forces with an approximate method, angular-momentum projected Hartree-Fock, to describe rotational motion of nuclei. I looked specifically at medium-sized even-even nuclei such as that of 20Ne, 24Mg, and 48Cr. My computations produced several promising results that exhibit clear rotational band structures in medium even-even nuclei comparable to experimental data. This suggests rotational motion is a robust phenomenon arising from nuclear forces, and motivates further application of projected Hartree-Fock to ab initio calculations.

193 11:30 am

Structure and Stability of Compact Stellar Twins Miguel Correa, Physics (U)

When a massive star exhausts its nuclear fuel and reaches the end of its lifetime, it collapses into a more compact object, forming new states of matter in the process. A sufficiently massive star can become a neutron star, an object that consists mostly of neutrons. These stars can have different radii depending on their mass, but reach only one maximum mass configuration at a specific radius. This situation may be significantly different if a phase transition to exotic matter, foremost quark matter, occurs in the cores of neutron stars. Quark matter is a new type of matter made up of guarks, which are the most fundamental building blocks of matter. In this case, a second maximum mass configuration (twin star) in the mass-radius relationship may become possible, which would be discontinuously connected to the first maximum mass stars. The properties of neutron stars and their twin stars are investigated in this study. Particular emphasis is put on the features (radii, masses, moment of inertia, gravitational redshifts, rotational evolution and stability) which distinguish twins from standard neutron stars. The results are based on numerical solutions of Einstein's field equations of General Relativity. Our findings offer insight into the properties of quark matter and its role in compact astrophysical objects.

194 11:45 am

Ab Initio Calculations of Rotating Heavy Nuclei **Dillon Adams, Physics (U)**

Recent advances in nuclear theory allow us to calculate from first principles the properties of light nuclei, such as their binding energies and rotational motion, in agreement with experiment. However, such calculations for heavy nuclei are computationally prohibitive.

Rather than carrying out a full calculation for heavy nuclei, we use an approximation known as angular momentum projected Hartree-Fock (PHF). For light nuclei we have found that PHF reliably approximates both numerical and experimental measurements of rotational motion. Here I will describe applications of PHF to heavy nuclei which are currently not tractable through other methods.

Our preliminary results show a surprisingly good agreement with experiment, despite the simplicity of the method, suggesting the robustness of rotational motion arising from ab initio forces. This will motivate us to extend PHF further for non-rotational motion as well.

195 12:00 pm

Quantum Kinetics and the Zeno Ansatz: Sterile Neutrino Dark Matter Produced in the Early Universe Olexiy Dvornikov, Physics (M)

We examine sterile neutrinos created via lepton asymmetry in the early universe. The creation rate of such sterile neutrinos

has characteristic resonances which have received little attention but are important in determining the relic sterile neutrino density and energy spectrum, i.e. whether sterile neutrinos are viable dark matter candidates. Before weak decoupling, the scattering time scale was shorter than the time associated with the expansion of the universe. Therefore, at this epoch, the Zeno ansatz - scattering interrupting the accumulation of a quantum phase, i.e. suppressing quantum transitions - is often assumed to ease computations. We employ an eighth-order Runge-Kutta to solve the full quantum kinetic equations and compare to the Zeno approximation. At the resonances in the creation rate the two methods differ. The scattering frequency is comparable to the quantum phase oscillation frequency and the Zeno ansatz breaks down. It underestimates the rate and, in turn, the relic sterile neutrino density.

196 12:15 pm

SubFlow: Modeling Geological Sequestration of Carbon Dioxide with Mimetic Discretization Methods Johnny Corbino, Computational Science (D)

Climate change is a scientific fact, not a rumor. The primary cause of climate change is the combustion of fossil fuels, which emits greenhouse gases (GHG). These gases trap the infrared radiation in the atmosphere rising the average temperature on the surface of the Earth. According to the Environmental Protection Agency (EPA), carbon dioxide (CO2) represents about 81% of the total amount of anthropogenic GHG in the atmosphere. The Department of Energy (DOE) and the EPA have proclaimed the geological sequestration of CO2 as an important measure to decelerate climate change.

In this work, we introduce a reliable software package to simulate the long term storage of CO2 injected into geological formations. Depleted oil fields and subsurface saline aquifers are examples of this type of formations, they possess the necessary characteristics (permeability, porosity, geometry, etc.) to retain the maximum amount of CO2 trapped for a relatively long period of time (millennia). The software that we are developing (SubFlow), takes into account all these required parameters in order to predict whether or not a preselected injection site is in fact suitable for CO2 sequestration.

SubFlow stands for "Subsurface Flow simulator", and it is conceived as an open-source, sustainable, and reliable software element that allows its users to model the transport of reactive chemical compounds (CO2, H2S, etc.) in porous media. Through SubFlow, the user can construct these injection scenarios by specifying their geometry, physical and chemical composition, and the location of the injection wells (depth, rate of injection, concentration, etc.). However, what makes SubFlow different from the rest is its numerical core (the module that actually solves the problem's governing equations).

In our software, we use a novel numerical approach to solve the main partial differential equations (PDE) that governs the migration of reactive compounds in porous media at typical injection depths. We use mimetic discretization methods (MDM) to attain higher-order accurate simulations without compromising the physical constraints inherent to the problem. For this type of problem, MDM have proven to be a versatile and competitive alternative to the widely used standard finite-difference (FDM) and finite element (FEM) methods.

Session B-2

Oral Presentation: Biological & Agricultural Sciences OR2 Friday, March 3, 2017, 11:00 am Location: Park Boulevard

197 11:00 am

Characterizing Heterogeneous DNA Methylation in Mycobacterium Tuberculosis Clinical Isolates with Single Molecule Real-Time (SMRT) Sequencing Samuel Modlin, Biological and Medical Informatics (M)

Background: Prokaryotic DNA methyltransferases (MTases) methylate specific motifs with high fidelity. DNA methylation serves diverse purposes in prokaryotes. In Mtb, it mediates gene expression changes in response to hypoxia. Recent work examining >200 prokaryotic methylomes showed methylation is highly conserved within phyla. Ancestral mycobacteria have all three known Mtases, yet clinical isolates exhibit loss of function in each of these MTases. Despite its potential relevance in adaptation to drug and host pressures, investigation of DNA methylation heterogeneity has never been examined in mycobacteria. We aim to characterize methylomic heterogeneity in Mtb and distinguish between its two forms: 1) genome-wide heterogeneously methylated motif sites (GHMS), suggesting heterogeneous MTase sequence and function; 2) Locus-specific hypomethylation (LSHM), suggesting targeted modulation of gene expression.

Methods: SMRT sequencing, complete de novo genome assembly, and determination of methylome of over 100 clinical isolates from high TB-burden countries were done using PacBio's SMRT sequencing and KineticsTools. An in-house pipeline determined heterogeneity patterns from kinetic data. Isolates with GHMS were examined for MTase sequence heterogeneity. Functional consequences of LSHM were determined by transferring H37Rv's annotation onto our genomes using RATT.

Results: Heterogeneous methylation appeared in isolates of all four major lineages, but is most varied in EAM isolates. Both forms of heterogeneity were present. LSHM was frequently observed at multiple loci of interest, including mamA motifs adjacent to genes implicated in hypoxic response, TAG accumulation, and several proteins associated with virulence. Motifs of the hsdM/hsdS1 MTase most commonly demonstrated site-specific heterogeneity, whereas genome-wide heterogeneity was most frequent in the mamB motif. We also report the first loss-of-function mutations in mamB. Conclusions: Lineage associated methylation heterogeneity is present in two forms, representing two fundamentally different processes. LSHM may reflect inherited methylation patterns, or may result from stochastic epigenetic switches. GHMS may represent an evolutionary point wherein cells lacking a functional MTase are becoming dominant or being phased out. Alternatively, it could indicate programmed phenotypic heterogeneity, a mechanism by which phenotypic heterogeneity manifests from minimal (single-base) indels in an MTase of a subpopulation, radically altering the methylome and creating phenotypically distinct lineages within the colony.

198 11:15 am

Computational Approaches to Explore the Correlation Between Protein Structure and Thermal Stability

Aishani Chittoor Prem, Bioinformatics (M)

Comparing the folding mechanisms of proteins with similar secondary structures yet with different sequences can provide fundamental insights in understanding important properties of proteins. Molecular Dynamics (MD) is a computational tool used to analyze protein dynamics and, in our study, the thermal stability of proteins on an atomistic level. Here, we describe the use of the AMBER 14 MD package to carry out computer simulations on two sets of protein mutants in order to understand the effect that point mutations (in the core of a protein) have on surrounding secondary structure elements and on overall protein thermal stability. The two sets of proteins are mutants of the β 1 domain of streptococcal protein-G and the human protein ubiquitin. MD simulations were conducted on a series of different mutants at simulated temperatures that ranged from 200K to 500K in 25K increments. The purpose was to study and analyze the energies and conformational changes that occur within the series of mutant test proteins at increasing temperatures. The results of these calculations significantly enhanced our understanding of the effect that core point mutations have on β -hairpin secondary structure elements common to both test proteins. The resulting MD trajectories were analyzed for retention of main-chain hydrogen bonds for the β -hairpin secondary structure elements as a function of increasing temperature. In a number of interesting cases, point mutations in the hydrophobic core reduced the residence time of certain main-chain hydrogen bonds for positions that were not in close proximity to the mutations. Computational evidence complimenting experimental results entailing the thermal stability of these mutants was found by analyzing their conformational changes during the course of these simulations. A major focus of this project is to adapt this form of dynamic simulations as a useful approach for providing computational results that are complementary to experimental data. The goal is to apply rigorous analysis that can be used as a pipeline for guiding protein design projects by providing a robust bridge between theory and experiment.

199 11:30 am

Investigating the Role of UPF3b in Pluripotent Stem Cells

William Bray, Molecular Biology (M)

The central dogma of molecular biology posits that DNA, the long-term repository of the genome, is transcribed into mRNA, which is then translated into protein product. Numerous mechanisms exist to maintain the integrity of the genome, but less well-known are how the mechanisms by which the cell maintains the quality of the mRNA message relate to the regulation of gene expression, particularly during development. Nonsense-Mediated Decay (NMD) represents one system through which the eukaryotic cell maintains mRNA guality, and has additionally been demonstrated to modulate the levels of otherwise 'normal' mRNA. NMD detects and destrovs mRNA transcripts that contain premature termination codons (PTC) which would preclude translation of a complete transcript, potentially leading to the production of proteins with dominant negative effects. Research has demonstrated that there exist multiple NMD pathways that rely upon suites of partially-overlapping proteins to carry out these crucial functions.

UPF3B is one protein which functions in NMD, and mutations in this gene are strongly linked to certain kinds of intellectual disability (ID) in humans, as well as to other developmental defects. Hypothesizing that mutations in UPF3B could disrupt neural development, the Wilkinson laboratory generated induced pluripotent stem cells (iPSCs) from a patient afflicted with loss of function mutations in UPF3B and ID, as well as a matched maternal control. In so doing, the Wilkinson laboratory has demonstrated that significant differences already exist in the proliferation of patient cells relative to controls. Utilizing an EdU (a thymidine analog which labels cells in 'S' phase) incorporation assay, UPF3B mutant iPSC lines were shown to exhibit defects in their ability to proliferate, a finding that was confirmed by cell-cycle analysis. RNASeq analysis of patient lines relative to controls revealed that approximately 20% of the patients' transcriptome is differentially expressed. Subsequent direct probing of transcripts via quantitative PCR found significant differences in transcripts associated with proliferation as well as neurodevelopment. These results, in addition to other published research, suggest that UPF3B and NMD are involved in the proliferation of stem cells, which may help to explain the etiology of UPF3B ID.

200 11:45 am

Kinetic Investigation of Human Polimerase Epsilon Anna Uvarova, Chemistry (M)

Endometrial and colorectal cancers are the third and fourth most common cancers affecting women in the US. Approximately 3% of colorectal and 7-12% of endometrial cancers contain mutations in polymerase epsilon (PoI ϵ), leading to an ultramutator phenotype. PoI ϵ is responsible for leading-strand synthesis during nuclear genome replication in eukaryotes and is comprised of a large catalytic subunit that contains conserved polymerase activity and an exonuclease domain with 3'-5' proofreading activity. Among all the reported Pol ϵ mutations, there are at least two hotspots located in the proofreading active site, P286R and V411L, that are predicted to strongly contribute to tumorigenesis. In my work I aim to establish the activity and fidelity of the PoI ϵ exonuclease domain mutations through pre-steady-state kinetic methods. This technology allows us to determine the rates of correct and incorrect incorporation of deoxynucleotides (dNTPs), extension past a mismatch, and DNA strand transfer. A construct containing the catalytic subunit of human Pol ϵ has been successfully heterologously expressed and purified in an E. coli expression system. We are currently characterizing the catalytic features and overall fidelity of wild-type (WT), P286R and V411L Pol ϵ . This kinetic investigation of different Pol ϵ mutants will provide a mechanisms of infidelity, allowing us to clarify mechanisms of and also give a deeper insight into fundamental DNA polymerase activity.

201 12:00 pm

Bacterial Minicells Delay Tumor Progression and Decrease Colon Inflammation in a Mouse Model of Colon Cancer

Mengxi Tian, biology (M)

Engineered bacterial minicells (VAX-IP) are non-replicating, nano-sized bacteria that are capable of targeting specific tumor cell-surface proteins and delivering a membrane pore-forming toxin that rapidly kills the cells. Minicell-based therapeutics are highly effective at tumor stabilization and regression in some animal models, but no study on colorectal cancer (CRC) has been reported. In this study, a colon cancer mouse model is being used to evaluate the therapeutic potential of VAX-IP in CRC. By conditionally-deleting the tumor suppressor Apc gene only in colon, tumors develop but leave the immune system intact. VAX-IP treatment of mice (1.5x10⁹ cells/ml, 1 dose/week) from 8-13 weeks of age, a time when lesions are only in the earliest stages, significantly decreases tumor number in mice harvested at 6 months of age (p=0.04). Similarly, when animals were treated later during the lesion development stage (age 14-19 weeks), a more significant decrease in tumor number (p=0.007) was observed.

Studies have shown that inflammatory mediators significantly contribute to tumor progression in CRC. To study whether VAX-IP might reduce tumor load by modulating the colonic environment and mucosal immunity, Chloracetate Esterase (CAE) stains for inflammatory granulocytes and mast cells were used. Numbers of CAE+ cells in normal or tumor-adjacent tissue were significantly lower in VAX-IP-treated mice in comparison to PBS-treated controls (=0.0002). Immunohis-tochemistry staining for inflammatory, myeloid-lineage cells using the marker CD11b also showed significantly decreased numbers in the VAX-IP animals treated at 14-19 weeks of age (p=0.003) but not in 8-13 weeks (p=0.4) or parental control (p=0.6) groups. Because macrophages also express CD11b, the F4/80 marker was analyzed on these mouse tissues, but

no significant differences were found. The three stains together suggest the difference in CD11b and CAE positive cells is in granulocytic cells and a granulocyte-specific marker Ly6G is being used to confirm this hypothesis. Together, these data strongly support the conclusion that VAX-IP don't affect the colon immune environment in the absence of tumors but when tumors are present, VAX-IP reduce inflammatory granulocytic infiltration into the colonic environment, which could contribute to the reduced tumor load in this mouse model of CRC.

202 12:15 pm

The Impact of Estrogen on Anti-tumor Immunity in Prostate Cancer and its Role in the Racial Disparity Harmony Saunders, Cellular and Molecular Biology (M)

Prostate cancer (PCa) is one of the leading causes of cancer related death in the U.S. and disproportionately impacts African Americans (AA) with 1.6x higher incidence and 2.3x higher mortality rates than Caucasian Americans (CA), indicating a racial disparity. Genetic and biological factors, such as anti-tumor immunity, may contribute to PCa progression and the racial disparity. We identified differential expression of two MHC Class II antigen presentation genes, HLA-DMB (8X higher in CA) and HLA-DPA (128X higher in CA) at the RNA and protein level in PCa. These genes play a critical role in the presentation of foreign antigen that activates the immune response and they play a role in effective anti-tumor immunity. Increased expression of these genes is correlated with improved survival in breast and ovarian cancer.

The class II transactivator (CIITA) regulates expression of MHC class II genes including HLA-DM and -DP. Breast cancer studies have shown CIITA expression decreases in the presence of estrogen, decreasing IFN-γ-induced HLA-DM and -DP expression. Estrogen impacts PCa progression; increased expression of estrogen receptor-beta contributes to tumorigenicity. AA patients are known to have higher serum estrogen levels than CA patients; therefore, we hypothesize that increased expression of estrogen in AA PCa decreases antigen presentation in AA tumors, thereby contributing to the racial disparity. Using established PCa cell lines isolated from CA (PC-3, DU-145) and AA (E006AA-hT, MDA-PCa 2b) patients, IFN-y (400IU/mL)-induced expression of CIITA is quantified via qPCR in the presence and absence of estrogen (10nM). MHC class II protein expression is analyzed using flow cytometry. Preliminary results show IFN-γ induced CIITA expression is decreased from $\Delta\Delta$ ct 1.79 to $\Delta\Delta$ ct of 1.5 in the presence of estrogen; however, MHC class II protein expression (HLA-DR) is only decreased by 2% in the presence of estrogen in E006AA. Other cell lines and MHC class II proteins (HLA-DP and -DM) are in the process of being tested. Our preliminary results indicate that estrogen may be impacting CIITA expression; however, the protein expression of HLA-DR is not altered. Studies on other cell lines will provide additional insight to prove or disprove our hypothesis.

Session B-3

Oral Presentation: Behavioral & Social Sciences OR3 Friday, March 3, 2017, 11:00 am Location: Tehuanco

203 11:00 am

Towards Ultimate Gender Diversity in Advertising: A Communicative Attempt to Emancipate Advertising from the Gender Binary Sandra Wagner, Communication (M)

This study is designed to reveal driving forces that can facilitate the emancipation of advertising from the gender binary. Contemporarily, the majority of commercials employ imagery that is in line with the gender binary. Traditional roles typically associated with women or men, respectively, are thereby perpetuated. Consequently, advertising fails to depict the gender diversity of our society. As a form of mediated communication, it contributes to the social construction of reality and owns responsibility in narrating a reality that promotes equality and diversity rather than uniformity. Within the discipline of communication, we can make a contribution to the emancipation of advertising from the gender binary by employing modes of communication that induce people to rethink their perceptions about gender. The present study suggests such modes based on six audio recorded and transcribed interviews, each of which was hold with another person that was considered an expert in the field of advertising and/or gender in the media. The modes are (a) causal reasoning, (b) constructive propositions, (c) instructive disclosure, and (d) critical illumination. Each of these modes represents an approach towards communicatively breaking the gender binary, thus arguing for the inclusion of marginalized target groups and new imagery. The implications for the advertising industry could be intriguing as the strategies discussed suggest innovative approaches to advertisers.

204 11:15 am

Creeping toward a model of "Creepathy" Alanna McLeod, Communication, (M)

An approach to modeling "creepathy," an experience colloquially known as "being creeped out" or "getting the creeps," is proposed. The purpose of the model is to provide a theory of a unique phenomenon, qualitatively different from fear, that is relevant to various lines of research, such as studies of threat, stigma, deviance, intimate partner violence, criminal victimization, and crime reporting. The model uses cognitive valence theory (CVT) as a starting point, conceptualizing creepathy as a moderate arousal state in response to ambivalent appraisals of an agent's intentions, or to ambiguous threat. This moderate arousal state prompts an attentional reaction, which is composed of both disengagement resistance and increased dwell time. This attentional reaction is the prerequisite for the cognitive appraisal process, which is influenced by positively correlated judgments of cultural, situational, and relational appropriateness. The appraisal process is also influenced by interpersonal valence, physical and psychological state, and personal dispositions, which are also positively correlated. The creepathy model predicts five possible and often multifunctional behavioral outcomes of this cognitive appraisal: moving with, moving against, moving away, moving inward, and moving outward.

205 11:30 am

Framing Electronic Toxins: A Content Analysis of South Korean E-cigarette Websites Taewook Ham, Communication (M)

Electronic cigarettes (e-cigarette) are battery powered devices that individuals can use instead of traditional cigarettes. Centers for Disease Control and Prevention (CDC; 2015) argue that e-cigarettes could negatively impact public health for nonusers exposed to secondhand aerosol vapor, delay smoking cessation among current smokers, and are dangerous to pregnant users. There are currently no strict regulations in South Korea for the online marketing of e-cigarettes to consumers. To explore the how marketing companies portray e-cigarettes online, framing theory (FT) is employed to examine South Korean e-cigarette websites. Through the lens of FT, this study seeks to explore how South market e-cigarettes to consumers. This study analyzed 55 South Korean e-cigarette websites. Each website coded for 16 criteria, including coder, website name, age restrictions, framing variables, the background of the homepage, and social media connection. We found out most of the websites are not claiming health, cessation, environment, and sex appeal. With regards to aesthetics of e-cigarette websites, the regulations of South Korea were embedded into the websites. We suggest that South Korea must have strict regulations on using e-cigarettes since people who are under 18 can access to e-cigarette websites. Also, e-cigarette websites need to present the harms of e-cigarettes.

206 11:45 am

I Sought It, I Reddit: An Exploratory Study of Reddit Users' Health Information Seeking Behaviors Will Silberman, Communication (M)

In response to the current innovation that is social media, public health research is in a prime position to explore the use of social media for information seeking processes. Reddit is a social media application and website dedicated to sharing and creating content. However, little research exists regarding use of the platform. Guided by diffusion of innovation theory, the purpose of this study was to analyze Reddit users' behaviors about the platform as well as determining their attitudes towards unique content shared on the platform. A survey was distributed to individuals who declared themselves to have knowledge of the platform through a survey recruitment tool on a college campus and a space on the Reddit platform dedicated to survey research. Data suggest that users who use the platform in greater amounts perceive the original content on Reddit to be credible sources of information. For those who seek information pertaining to health, data suggest that users perceive the original content to be less credible sources of information. Implications for future research include employing a content analysis to understand what kinds of information users on Reddit seek, as well as a comparative analysis regarding which specific forms of health information found on Reddit are credible in comparison to health information found on other platforms.

207 12:00 PM

Viral Trends: Understanding Media Use and Perceptions of the Zika Virus Joshua Santiago, Communication (M)

The U.S. Centers for Disease for Disease Control and Prevention (CDC; 2016) announced that one of the primary viral health concern for United States citizens is the Zika virus. This study explores the understanding of traditional media and relationships between news consumption and perceptions of the Zika virus. We adapted a model from hypothesized relations among media genres, audience motivation, and perceived risk. The main hypothesis we looked at is written as follows: Traditional (news) media consumption is positively related to the perceived risk of contracting and spreading the Zika. For this research, participants were recruited from an online research system at a large Southwestern University (n = 446). Participants completed a survey with 18-Likert type items that sought the knowledge of the Zika virus that they received from the televised media news. We found out that there was a significance between local and national news with perceived risk of contracting and spreading the Zika. The most important factor is that we confirmed media disseminated information of the Zika virus, and led people to have higher risk perceptions of Zika virus. Therefore, we recommend that the CDC and WHO should be aware that media will provide incorrect information about the Zika virus, which will likely lead to serious problems.

208 12:15 pm

Let's Get Digital: Student and Instructor Perceptions of Digital Literacy and Web 2.0 Tools in Writing Classes

Clarissa Dieck, Applied Anthropology (M)

Multimodal and digital media have become common sources of knowledge and communication in higher education. As a result, new and different forms of media to include Web 2.0, social media, and student-created websites and blogs have been incorporated into coursework. The trend towards digital pedagogies is evident on our own campus, and digital media are included in introductory writing classes (Rhetoric of Written Argument 100 or RWS 100) as part of the Digital Humanities Initiative at San Diego State University. There are limited qualitative studies in higher education that investigate digital technologies in university pedagogy. In order to understand how these transformations in pedagogy are being received, qualitative research is needed to explore the actual lived experiences of students and instructors. These experiences may challenge certain arguments about technology use and digital literacy for those born within the timeframe of the digital native, or after 1980. This research investigates the ideas of students and instructors that go into transforming pedagogy at the university level to include digital media in RWS 100 classes. This project aims to address three main questions: 1) How do the perceptions of different forms of media by students and instructors affect their use and reactions towards them for educational outcomes? 2) How do students and instructors conceptualize and integrate digital literacy into teaching and learning? And 3) How do students and instructors compare the relationship of digital literacy to "traditional" literacies? The preliminary findings of this study are based off of data from in-depth interviews with students and instructors, participant observation in classrooms, and an open-ended questionnaire.

Session B-4

Oral Presentation: Visual or Performing Arts OR1 Friday, March 3, 2017, 11:00 am Location: Aztlan

209 11:00 am

RISE UP: The Formation and Reimagining of American National Identity in *Hamilton* Susanna Vaughan, Musical Theatre (M)

Since the nation's founding, artists, scholars, and politicians have attempted to define a national identity that would unite its citizens. After two hundred years, two world wars, and significant social movements, the conversation continues to be as complex as when the Declaration of Independence was signed. How does a nation built on common ideals rather than common heritage form a national identity, especially when the majority people living in the United States today can trace their roots elsewhere? America needs an identity as complex and distinct as its people.

To see an example of the journey to define this identity, we need only look to The Great White Way. Created by Lin-Manuel Miranda, Hamilton: An American Musical tells the story of one of America's founding fathers, featuring a cast of mostly people of color and using an amalgamation of contemporary music styles alongside traditional musical theatre. Miranda turns history on its head by taking a traditional American story and telling it through the mouths of people whose races are, for all intents and purposes, neglected in the narrative. Through its music and casting choices, *Hamilton* celebrates the historical formation of American national identity while simultaneously calling it into question, inviting Americans to reconstruct a more inclusive, dynamic identity. Through investigation and analysis of the music styles, lyrics, and casting choices, I will demonstrate how Hamilton paints an idealized picture for the future disguised in a contemporary re-telling of the past, and calls for a revolutionizing of American identity.

210 11:15 am

Actor-Musicianship on the American Stage: An Evolving Theatrical Genre and How Theatre Educators Can Respond

Kathleen Banville, Musical Theatre (M)

This research observes and analyzes the increasing use of actor-musicianship in American musical theatre-wherein the actors in a production also serve as musicians playing the score-and the new conceptual frameworks being explored as a result. By examining the evolving aesthetic of actor-musicianship in American musical theatre, the research seeks to inform and guide the training efforts of theatre education institutions moving forward. As part of this effort, the study will explore how this new kind of multi-disciplinary performer and mode of training could coordinate with the current triple-threat standard in musical theatre education. The research explores options for how the current training modality can be modified or expanded to meet the demand for actor-musicians, whether by expanding programs to offer guadruple-skill curriculum or developing new actor-musician programs as a distinct alternative to the existing actor/singer/ dancer degree programs. The research involves an examination of recorded productions employing actor-musicians, including the John Doyle revivals of *Company* and *Sweeney Todd*; seeing live performances of new productions developed around actor-musicians, including Justin Huertas's Lizard *Boy*; and an examination of Jeremy Harrison's landmark publication on the history, development, and nurturing of actor-musicianship in the United Kingdom and its influence on the emerging form in the United States. In addition, the study includes a survey of training options currently available through major educational institutions, with an examination

of existing actor-musicianship programs in the United Kingdom and the differing coursework offered in Bachelor of Fine Arts and Bachelor of Music musical theatre degree programs at American universities. In mapping the course of actor-musicianship in American theatre, this study aims to illuminate a path for musical theatre educators as they prepare students to meet the demands of a changing theatrical landscape.

211 11:30 am

Western People Funny: A Brief Examination of the American Portrayal of the Siamese Culture in The King and I

Vinh Nguyen, MFA Musical Theatre (M)

This research topic examines the portrayal of the Siamese culture depicted in the musical *The King And I* by Rodgers and Hammerstein. A comparison is drawn between the 2015 Broadway revival of production and its predecessors, mostly the 1996 revival of the same caliber. The research draws upon primary and secondary sources such as personal and published interviews, theatre reviews, and academic publications, to explore the creative approach and process of these two productions and their critical reception. From the comparison, it is concluded that while past productions achieved commercial and critical success in their time, they no longer hold up to the cultural and racial standards of contemporary American theatre. It is the hope that this research paper will inform and encourage future theatre makers to be more conscious, considerate, and inclusive when it comes to reviving culturally and racially sensitive classics.

212 11:45 am

Gesamtkunstwerk and West Side Story Jonathan Brugioni, Master in Fine Arts in Musical Theatre (M)

This study will connect the German artistic philosophy of Gesamtkunstwerk, which translates to "total artwork", to the 1957 musical West Side Story. In 1849, composer Richard Wagner laid out three pillars of his philosophy for the pursuit of Gesamtkunstwerk in an essay titled The Artwork of the Future. Those pillars are The Art of Dance, The Art of Tone, and The Poetic Art. Wagner believed that Gesamtkunstwerk would be achieved through the synthesis of these three artistic faculties. Each pillar would exist by being subservient to the story and the work as a whole. The examination of the successful aspects of each pillar of art and their successful synthesis in West Side Story can explain West Side Story's lasting success in the canon of theatre. This philosophy and understanding of its use in the creation of West Side Story serves as an example of how theatre creators can successfully synthesize The Art of Dance, The Art of Tone, and The Poetic art to create "total artwork".

213 12:00 pm

Musical Theatre Education Transformation: How to adapt American musical theatre education to build a solid B.F.A. curriculum in Taiwan Yu-Ning Change, Musical Theatre (M)

The purpose of this project is to create a solid 4-year musical theatre college curriculum in Taiwan, where musicals are highly regarded but none of the 160 colleges offers Musical Theatre as a degree. In August 2016, National Taiwan Normal University (NTNU) pioneered and established a Bachelor's degree program in performing arts with the emphasis on musical theatre; however, the curriculum is not well structured. In Taiwan, there are many potential young actors who are eager and interested in this area but find no direction to improve their skills, nor guidance on how to use these skills to pursue a career.

The first step will be analyzing and comparing the curriculum that NTNU offers to The Top 10 Musical Theatre B.F.A. Programs in the U.S. for 2016-2017. In addition, the cultural differences between these two countries will be carefully considered. Subsequently, selected students or alumni from those programs will be interviewed about their experiences and feedback on the training they received from those programs. A blueprint can be drawn on what courses should be implanted, inserted, adjusted or removed from the current NTNU curriculum.

According to the blueprint, a weeklong workshop will be carefully designed and held in Taiwan. This workshop will test what kind of classes and pedagogies can smoothly and seamlessly transition to Taiwan, while some parts may require more adjustments and preparation to local students.

What Taiwan needs is a solid, constructive, and professional training system, which can prepare young talented students well before entering the professional world. It is impossible to take such a drastic leap over night. Only by meticulously executing, examining and reflecting on every step can the education system be built comprehensively, therefore bringing the musical theatre industry in Taiwan to the next level.

Session B-5

Oral Presentation: Biological & Agricultural Sciences OR3 Friday, March 3, 2017, 11:00 am Location: Metztli

214 11:00 am

The Potential of Chicken-Poop Powered Hydroponics: A Creative Method of Utilizing Nitrifying Bacteria to Convert Chicken Manure into Useable Nitrogen for Crop Plants Chris Long, Biology (U)

Chicken manure is a natural by-product of poultry farms on California ranches that collects in piles behind commercial facilities. This manure is a poor agricultural fertilizer in its raw form due to its high ammonia and urea, and low nitrate contents, ultimately resulting in egg ranches paying to have it removed, which can be costly. However, if this manure can be cheaply and easily converted to a more usable form of nitrogen, it can be incorporated into a hydroponic agricultural system on the premises, thereby reducing waste and providing a cheap source of fertilizer. For my research, I wanted to determine if chicken manure could be effectively and cheaply converted into a more biologically available form of nitrogen (e.g. nitrate), which can then be utilized by crop plants in an agricultural setting. I did this by running a dilute solution of raw chicken manure and water through a bioreactor and then into hydroponic grow beds as a fertilizer to standard garden vegetables and compare their growth with those grown using either a commercial fertilizer or in the absence of fertilizers. The experimental design resulted in 30 independent systems that were arranged in five blocks, with one treatment placed at randomly assigned positions in each block. Variation in nitrate and ammonia concentrations of the water, and growth and nitrogen content of the lettuce among the six treatments was assessed with separate one-way blocked ANOVAs, followed by planned comparisons as posthoc tests. Lastly, green leaf lettuce (Lactuca sativa), a common crop plant in hydroponic gardens, was grown in the grow beds of 25 of the systems. The results of this research showed that the systems that utilized the manure with the bioreactor performed as well as those grown in the commercial hydroponic fertilizer, with the notable difference that there was no build-up of salt residues in the bioreactor systems, unlike the commercial fertilizer. This means that there is no need for regular water changes while achieving growth comparable to commercial products at virtually no increase in cost.

215 11:15 am

The Use of Chemosensory Cues by Kangaroo Rats in Discriminating Among Snake Predators Jessica Ryan, Biology (U)

All animals must obtain enough food to survive and reproduce. As such, a balance exists between foraging and vigilance. Small mammals have been shown to use visual, auditory, and olfactory cues to detect a variety of predators, including both venomous and nonvenomous snakes. In this study, we have designed experiments to see if Desert kangaroo rats (Dipodomys deserti) use olfaction to detect predators, and if so, to see if they respond differently to chemical cues from snake species that use distinct foraging styles that would correspond with varying degrees of danger. We are attempting to determine if the sidewinder rattlesnake (Crotalus cerastes) is chemically cryptic to its prey, as seen recently in the puff adder (*Bitis arietans*), another ambush forager. We hypothesize that kangaroo rats will exhibit vigilance towards active foraging snake species, and not be able to detect sidewinders if they are capable of chemical crypsis. In order to determine how kangaroo rats respond to the odors of different predators, we presented predator odors to free-ranging rats in a standardized fashion. We conducted 124 trials over the course of 6 weeks during the Summer 2016 field season. Currently, we are counting the timing and occurrence of six antipredator

behaviors in each trial as examined by past researchers, such as jump backs, sand kicks, foot drums, and head-up pauses. The results of this study will allow us to determine how widespread the apparent "chemical crypsis" is that has been documented in one other ambush foraging snake species. We will also gain valuable insight into the antipredator behavior of a key species in desert ecosystems.

216 11:30 am

Kangaroo Rats Change Body Temperature When Investigating Rattlesnakes

Hannes Schraft, Ecology (D)

Cues such as prey condition, size, or state of arousal inform predators of the likelihood of a successful attack. This is especially important for ambush predators that rely on surprise to catch their prev. For infrared-sensitive predators like rattlesnakes, one avenue of prev evaluation is prev body temperature. In the lab, small mammals can experience a temporary rise in body surface temperature as a response to stress through several physiological mechanisms. Thus, through an increase in emitted heat, prey may be 'leaking' information about their state of arousal or vigilance. I determined whether wild rodents undergo similar changes in body surface temperature upon detection and interaction with rattlesnake predators. I staged interactions of free-ranging Merriam's kangaroo rats (Dipodomys merriami) with Mojave rattlesnakes (Crotalus scutulatus) at baited feeding stations and recorded interactions with a thermal-imaging camera. Kangaroo rats showed a significant change in snout, head, and tail temperatures during interactions with rattlesnakes. This supports the hypothesis that presence of a predator induces body temperature changes in prey animals. Such changes in prey heat signature would be detectable by heat-sensitive rattlesnakes, and we can expect to see rattlesnakes take advantage of this sensory information about prey vigilance by adjusting predatory behavior accordingly.

217 11:45 am

Types of Floral Visitation Influence the Composition of Floral Nectar Microbial Communities Megan Morris, Ecology (D)

Floral nectar is a specialized environment which supports a specific suite of microbes (bacteria, microfungi, yeasts). Floral visitors and pollinators are believed to be the primary vectors for microbial inoculation of floral nectar, yet the composition of microbes deposited into nectar is poorly understood. In this study, we use both culture-dependent and culture-independent methods to describe the abundance, composition, and function of microbial communities present in floral nectar of a California native shrub, *Epilobium canum*. We characterize the microbiota in *E. canum* nectar along a temporal trajectory of floral stages. In addition, we describe the composition of microbes deposited into floral nectar robbers (carpenter bees), compared to non-visited flowers. We found that the culturable bacterial (p=0.002) and

yeast (p<0.001) abundance increases in floral nectar through time, as floral development progresses from anthesis (initial petal opening) to senescence (terminal floral stage). When flowers were visited, the abundance of culturable bacteria (p<0.001) and yeast (p=0.01) in nectar increased compared to non-visited flowers. Microbes cultured from E. canum floral nectar were isolated, and their 16s rRNA (bacteria) or ITS (fungi, yeast) gene regions were sequenced and annotated. From 118 isolates (64 bacteria, 54 fungi/yeast), we identified 13 bacterial and 12 fungal/yeast genera. We found that floral visitors deposit a high abundance of species within microbial genera Acinetobacter and Metschnikowia, which are absent from non-visited flowers. Nectar from pollinated flowers contained genus Penicillium, which was absent from non-visited and robbed flowers. Furthermore, we found that robber-deposited microbes excluded certain taxa from floral nectar. Genera present in non-visited or pollinated flowers, but excluded from robbed flowers included Cladosporium, Kocuria, and Qualambria. By depleting nectar resources from flowers, nectar robbers disrupt normal plant-pollinator interactions. Here we show that nectar robbers have the potential to further influence this interaction, through the deposition and subsequent alteration of microbes in floral nectar. Further analysis in this study will include a metagenomic description of the taxonomic and functional potential of the entire microbiota in *E. canum* floral nectar. Overall, our study will provide greater insight into the complex system of plant-pollinator-microbial dynamics.

218 12:00 pm

Microbial Mediation of the Decomposition of Marine Foundation Species, Macrocystis Pyrifera John Haggerty, Ecology (D)

Kelp, Macrocystis pyrifera is a foundation species with a global distribution and acts as a primary producer while generating structural habitat. Kelp sustains not only the immediate ecosystems, but also neighboring habitats including beaches, estuaries and deep sea canyons were the kelp is deposited overtime. As the kelp ages or decomposes, its tissues become more nitrogen rich. While the aged kelp has been shown to be a better food source than fresh kelp to a wide suite of organisms. the microbial communities regulating the decomposition of kelp is unsubstantiated. To assess the role of the microbial communities, kelp was decomposed under two temperature conditions, 12 and 22 °C with a normal kelp microbial community and an initially sterilized treatment. Changes in microbes and kelp tissue were followed through time. We found that the microbial communities differ significantly across time, temperature, and sterile treatments with a significant interaction term between temperature and time. The difference is driven by a transition from a Pseudoalteromonas dominated community to one dominated by Sulfitobacter. These correspond to a change in functional gene composition from plant-prokarvote DOE subsystem and RNA processing and modification to fermentation and fatty acid metabolism. Of the kelp tissue measurements, carbon is the best explanatory variable. These changes in community composition are the result of the loss of easily available sugars overtime and a transition

to more complex forms of carbon within the kelp tissue. As microbial communities are shown to undergo both changes in composition and trophic strategies, these have implications on the nutritional quality of kelp as a food source overtime to coastal marine systems.

219 12:15 pm

Remote Sensing of Wildfire - Examining the Environmental Controls of Fire Spread William Brewer, Geography (D)

The objective of this research is identify and map fire spread units directly from aerial thermal infrared imagery (ATIR) and then to determine landscape-level biophysical controls on the fire spread rate (FSR) between intervals. Two recent wildfires (2016 Cedar and Rey) were flown using an advanced ATIR system at short repeat intervals. Fire segments were manually delineated and digitized in ArcGIS from the imagery and then used to extract slope and pre-burn vegetation conditions. Normalized Difference Vegetation Index (NDVI), calculated from 2016 NAIP data, represented pre-fire vegetation conditions and a 10 meter DEM was used to calculate slope. Results indicated that NDVI had a modest positive correlation with FSR (R2 = 0.39) and slope a strong positive correlation (R2 = 0.83) with FSR. Furthermore, the unit of analysis scale greatly affected results with larger spread units showing greater correlation with NDVI and slope than smaller units. These results will help inform researchers about the types of biophysical variables that influence fire spread rate and the appropriate scale of analysis to study wildfire.

Session B-6

Oral Presentation: Behavioral & Social Sciences OR4 Friday, March 3, 2017, 11:00 am Location: Templo Mayor

220 11:00 am

A Rough Road Home: Barriers to Accessing Treatment for Post Traumatic Stress Disorder in Former and Active Military Darion Miller, Anthropology (U)

According to the U.S. Department of Veteran Affairs, between 11 and 20 percent of soldiers who served in Operation Iraqi Freedom or Operation Enduring Freedom have Post Traumatic Stress Disorder (PTSD) in a given year. In San Diego, 1 in 5 Recent Combat Vets have PTSD. At least 27 veterans under age 45 died by suicide in San Diego County between 2014 and the first half of 2015. The numbers continue to rise, but the solutions don't. The purpose of my research is to explore how the health care system is set up to help military personnel with PTSD and how it often fails them. I will also be identifying how military culture prevents individuals from

seeking help. This study utilizes data from three Licensed Practical Nurses who each have 15+ years experience working with veterans, one clinical therapist and one former Marine. I have also collected data by observing veterans in a clinical setting. I am still recruiting former military personnel for my research. The rest of my data comes from previous studies and supplemental information that was supplied by the United States Marine Corps. As my research is currently ongoing, I have not yet reached any final conclusions. I have found that although treatments for PTSD exist, former and active duty military have difficulty accessing them for several reasons. These reasons include military culture, denial of symptoms, fear of having a mental health issue on one's record and/or not having the resources available to access help. Because PTSD is a condition that can never fully be healed, managing the symptoms of PTSD is a long and ongoing process. This is an important issue because it affects the lives of our military veterans every day. I believe this study can bring awareness to our community and also help erase the stigma surrounding Post Traumatic Stress Disorder.

221 11:15 am

Racial Differences in Motor Impairment Post-Stroke Neco Johnson, Psychology (U)

Stroke is the leading cause of severe, long-term disability in the United States. Although many recover a portion of their original functional capacity, racial disparities in the degree of functional recovery post-stroke are well documented. Little work, however, has been done to identify specific racial differences in motor functioning post-stroke. The aim of this thesis is two-fold: to determine whether there are racial differences in motor functioning post-stroke between non-Hispanic Blacks and Whites; if there are differences, factors that might mediate the disparity will be examined. One-hundred-seventy adult stroke survivors (91 Black; 79 White), who participated in a multisite study investigating rehabilitation outcomes following injury, completed a comprehensive battery, including measures of socio-demographic characteristics, health literacy, and healthcare use and access. Stroke severity was assessed with the modified Rankin Scale and motor function was assessed with the NIH Toolbox Motor Battery, using demographically-corrected norms. The groups will be compared on socio-demographic, motor, and stroke characteristics via independent sample t-tests (or Wilcoxon rank-sum tests) for continuous variables and Chi-Square tests (or Fisher's exact) for categorical variables. If a difference in motor performance is found, a multivariable model on the motor domain in question will be performed, adjusting for covariates that were found to be significantly different between racial groups. It is hypothesized that NH Blacks will show more motor impairment on the NIH Toolbox Motor Battery, which is corrected for demographic differences (including race/ethnicity differences) in the normal population, than NH Whites. Further, it is hypothesized that this difference will be mediated by differences in healthcare characteristics. More specifically, it is expected that the difference will be mediated by differences in healthcare access among NH Blacks and NH Whites.

222 11:30 am

White Matter Compromise in Autism Spectrum Disorder After Careful Group-Matching for Motion Nicole Baggett, Psychology (U)

Background: Previous research using diffusion-weighted magnetic resonance imaging (DWI) has reported reduced fractional anisotropy (FA) and increased mean and radial diffusivity (MD and RD) in various white matter tracts in participants with Autism Spectrum Disorder (ASD) compared to typically developing (TD) participants. However, many of these studies did not match groups on in-scanner head motion, which may confound results, or did not fully address the effects of age. Consequently, white matter differences previously reported in ASD literature should be treated with caution, and white matter microstructure deserves additional study with proper care for these important factors.

Objective: To determine whether maturation of white matter microstructure differs between 8-18 year olds with ASD and TD participants in a sample well-matched for head motion and age.

Method: DWI was collected from 27 participants with ASD and 30 TD participants. Groups were carefully matched on age, non-verbal IQ, and head motion (translation and rotation). Probabilistic tractography was performed using TRACULA, an automated method for reconstructing 18 major white matter pathways. Groups were compared on FA, MD, RD, and AD (axial diffusivity) in each of these pathways.

Results: Regression analyses were performed with subject group, age, and an interaction term included in the model. To correct for multiple comparisons, an alpha level of α = .0028 from the Bonferroni correction was used to determine significance. Some white matter pathways showed significant effects of age, but there were no significant group-by-age interactions. Group effects were limited to the right uncinate fasciculus which showed significantly reduced FA and increased RD in the ASD group compared to the TD group.

Conclusion: Our findings of reduced FA and increased RD in ASD are partially consistent with previous findings. However, prior studies on the uncinate fasciculus, understood to be involved in self-awareness and emotional regulation, have yielded inconsistent evidence of group differences. The finding of irregularity in the uncinate fasciculus may relate to cognitive socio-emotional functioning deficits found in ASD.

223 11:45 pm

Restriction Spectrum Imaging of White Matter in Autism Spectrum Disorder

Seraphina Solders, Biology & Psychology (U)

Background: Diffusion-weighted magnetic resonance imaging is a non-invasive, in vivo tool that allows us to characterize the microstructure of white matter pathways in the brain. Findings in children and adolescents with Autism Spectrum Disorder (ASD), e.g., reduced fractional anisotropy (FA) and increased mean diffusivity (MD), suggest anomalies in white matter organization or content, but can be difficult to interpret biologically. Restriction spectrum imaging (RSI) is a novel multi-shell diffusion imaging technique that can be used to describe microscopic white matter features such as neurite (axon and dendrite) density (ND) which may be more meaningful. Although a few studies have applied similar multi-compartmental diffusion models in ASD research, none have applied RSI to this population. Objective: To examine group differences and age-related effects in ND, FA, and MD in the white matter of children and adolescents with ASD and their typically developing (TD) peers. Methods: RSI was collected from 24 ASD and 20 TD participants. Groups were well-matched on age, non-verbal IQ, and head motion. A standard atlas of white matter from Johns Hopkins University was transformed to each participant's native diffusion space allowing extraction of ND, FA, and MD in 20 white matter pathways. Results: Repeated measures ANCOVAs were performed separately on ND, FA, and MD with group, pathway, and hemisphere as independent variables, and covarying for age. Analyses were performed separately for intrahemispheric and interhemispheric pathways. A Bonferroni correction was applied to correct for multiple comparisons. Results for intrahemispheric pathways indicated significant positive effects of age on FA and ND, and a negative effect on MD. Main group effects did not survive the Bonferroni correction, and there were no significant effects in the interhemispheric pathways. Conclusions: Results from this study support previous findings of age-related increases in FA and ND and decreases in MD during typical development. However, prior findings of group differences in FA and MD were not replicated. Further, these results suggest that individuals with ASD do not differ significantly in white matter ND compared with TD individuals.

224 12:00 pm

Does More Equal Less: F-CBT Attendance on High-Risk Offender Recidivism

Erica McDaniel, Social Work (M)

The history of adult probation services in California is complex and has vacillated between a rehabilitative and punitive approach. While California was one of the first states to promote the development and use of community correction services, as shown in the adoption of the Probation Subsidy Act of 1965, the late seventies saw an increase in crime and a change in nationwide trends regarding the purpose and function of probation. This idea that "nothing worked" and that it was better to simply lock up offenders continued until 2007 when California's prison overcrowding reached crisis proportions. This led to the pendulum swinging back to rehabilitation and the passing of two major bills-SB 678 and AB 109. These bills encouraged the development of evidence-based intervention programs through sustainable funding and aimed to help California close the revolving door of low-level inmates cycling in and out of state prisons. The purpose of this study is to examine probationer use of an evidence-based group curriculum, Forensic Cognitive Behavioral Therapy (F-CBT), to better serve and further decrease the recidivism of high-risk offenders. In order to do this we will analyze the demographic and risk predictors of probation clients who participated in

an F-CBT program as compared to those who were referred but never participated in the program. We hope to generate initial outcomes about the level of recidivism between groups. My hypotheses are that, as risk factors increase attendance and completion rates will decrease; in addition to this, as participation in the program increases, recidivism rates will decrease. This is a study using secondary data from San Diego County Probation. Measures include demographic, risk, and resiliency variables as well as program attendance and completion

Session B-7

Oral Presentation: Humanities OR2 Friday, March 3, 2017, 11:00 am Location: Visionary Suite

225 11:00 am

The Art and History of San Diego Presidio Ceramics circa 1820-1840

Shawna Bishop, History (U)

It is widely believed that there was no significant trade between Mexico and California during the 1820's and 1840's. This panel uses an unstudied collection of majolica and galenaware ceramic archaeological finds from the San Diego Presidio to engage an interdisciplinary study of San Diego's early nineteenth century art, history, and archeology. The collection serves as the foundation of undergraduate research on the art, trade, and cultural significance of Mexican pottery in Spanish San Diego. The continuation of the interdisciplinary team's research will lead to an Old Town San Diego State Historic Park's museum exhibit.

History students researched the trade between Mexico and San Diego that brought ceramics here. Based on findings through extensive research conducted at the San Diego History Center and from a wide variety of sources from online databases, the history students have found that the wide belief concerning trade is not true. Furthermore, their findings will lend to the development of further research of individuals who were instrumental in the movement of ceramics and other goods during this period.

This section of the presentation intends to analyze the range of primary and secondary source material found at the San Diego History Center. The examination of the Adele Ogden papers shows that there was a few important trade vessels and merchants instrumental in the trade of ceramics during this time period. Henry Fitch was a prominent figure in the 1800's concerning trade into San Diego. By studying a collection of documents once belonging to the Fitch family the movement of goods, including ceramic wear can be seen. Furthermore, source material from the Adele Ogden records shows that San Diego was an important trade port between the 1820's and 1840's.

226 11:15 am

The Art and History of San Diego Presidio Ceramics circa 1820 - 1840 Domenique Maj, History (U)

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This presentation will discuss the studies conducted by David Igler who argues how and why a new "system" of trade developed during this time. Additionally, overland trade/travel or mulos will be discussed as presented by the research of Clara Elena Suarez Arguello. The purpose is to introduce the trade systems on the Pacific during this period in order to compliment the primary research conducted. Lastly, examples of how this research helps to reinforce the teams conclusions based off the collection of business records and correspondence of Mr. Henry Fitch, prominent member of San Diego. Primary and secondary records combined demonstrate that San Diego was an important trade destination for not only ceramics but also other goods being brought from Mexico.

227 11:30 am

The Art and History of San Diego Presidio Ceramics Circa 1820-1840 Erik Fredrickson, History (U)

Before the Spanish arrival to the Americas the indigenous populations already had a ceramics tradition, but after the Spanish arrival in the 16th century major changes to the production of mayolica and majolica occurred. Guilds controlled production of majolica and ceramics during the period of Spanish rule over the Americas. The ceramics they produced were sold locally and traded with eastern colonies such as the Philippines and with China; further trade occurred after returning from China the ships would arrive in Acapulco and would travel across the land to the port in Veracruz where the goods would be shipped to Spain. Mexican independence in the 1820s transformed both the ceramics trade and their production. Most importantly, the pottery guilds were abolished after Mexico gained its independence from Spain which allowed potters to make any type of pottery that they wanted. This would however lead to an overall decline in quality of the ceramics over the course of the 19th century. Another major change was that the primary color of the ceramics changed from green to blue due to a shortage of tin at the time which was used in some of the glazes. Next, free trade exposed potters to competition from the Chinese and British.

San Diego was not a major trade destination during the early nineteenth century. Research shows that ceramics were shipped to Alta California locations such as the Presidio at Santa Barbara. These ceramics were generally Majolica, Galera, and Tonala Brunida wares. The secondary research on this trade suggests that the early nineteenth century majolica ceramics imported into San Diego were likely to have come from Veracruz, and that those produced between 1820 and 1840 were likely to bear patriotic and nationalistic motifs. However, archaeological research at the Presidio reveals that the majolica that arrived in San Diego originated in Puebla and Mexico City.

This paper contributes to the Art and History of the San Diego Presidio Ceramics panel by presenting research on the early history of ceramics trade and production in Mexico, and by examining how Mexican independence transformed that industry.

228 11:45 am

Replication and Research of 18th Century Puebla Pottery

Jessica Van Ruiten, Applied Design (U)

SDSU ceramics students conducted a research project to replicate nineteenth-century Puebla pottery, and analyze how the original pottery was made. To date, there is little scholarship on San Diego's material, culture, and trade, Archeological materials that were excavated at the San Diego Presidio in the 1970's have never been analyzed. We are connecting our research on the nineteenth-century Puebla pottery manufacturing techniques with the information that the history team gathered about trade routes, colonization, and cultural interaction to inform our understanding of Puebla pottery. Our research involved identifying traditional colorants, looking at which materials are currently available, researching fragments of original Puebla pottery, and coming up with substitutions for ingredients that are no longer in use. We worked together with experts from the Archeology lab and history students to research the historic clay and glaze techniques to produce accurate replicas of the ceramics used at the Presidio in early nineteenth-century. Majolica glazes used to decorate the original wares contained ingredients such as tin and lead, and therefore had to be reformulated without the use of harmful toxins. Our research and testing has shown that, with the balance of traditional and contemporary processes. techniques, and colors, it is possible to achieve a very similar anesthetic as the original pottery from Puebla without the use of harmful ingredients.

229 12:00 pm

The Archaeology of San Diego Presidio Ceramics: 1820-1840

Cecelia Holm, Applied Anthropology (M)

This presentation will be part of a panel of students presenting interdisciplinary research on a collection of majolica and galenaware ceramics from the San Diego Presidio. The team brought together students from History, Art, and Anthropology, and looked into several different aspects of these ceramics, including the design, trade, and cultural significance. History students studied the trade routes these ceramics traveled, and found evidence to refute a long-held belief that very little trade took place between California and Mexico during this period. Art students studied glaze and profiles, in order to create replicas of various pieces.

For an archaeological perspective, students consulted the SDSU collections management report on the Presidio artifacts, as well as other sources addressing analysis done in this area. San Diego State University and various other institutions have undertaken several different excavations at the San Diego Presidio, beginning in the 1920s, thus a large collection of ceramic is present at the university. Students were able to talk with researchers currently studying the majolica in the collection, in addition to consulting records from these excavations. The presence of these ceramics at the Presidio supports the conclusion reached by the History students - that trade was occurring in California during this period.

Session B-8

Oral Presentation: Education OR1 Friday, March 3, 2017, 11:00 am Location: Legacy Suite

230 11:00 am

San Diego State University Textbook Market Joseph Shapiro, Computer Science (U)

This research looks at the current state of the college textbook market specifically at San Diego State University. Cost, resale value, and existing alternative methods for acquiring textbooks are the major focuses of this research. The methods invoked for acquiring data include: interviewing students, searching the campus library, asking library faculty about textbooks available in the library, and checking buyback potential for a sample of books at the campus bookstore. The data in this project are primarily relevant to San Diego State University as they are based on its students, bookstore, and library.

231 11:15 am

Perceived Faculty Support in Freshmen Year Boosts First-generation College Students' Belonging and Persistence in Science Garam Ann Lee, Psychology (M)

Students who are the first in their families to attend college (i.e., first-generation college students, FGS) experience greater concerns about fitting in during the transition to college (Stephens et al., 2012). FGS in science majors report greater feelings of belonging uncertainty (Harackiewicz et al., 2015). While previous research has examined how differences in family backgrounds and culture contribute to belonging concerns (Stephens et al., 2012), the present study focused on cues that students might attend to during their first semester in college. We hypothesized that students, particularly FGS, who perceive science faculty as more supportive will experience a greater sense of belonging, which in turn will predict higher subsequent interest in science.

Freshmen science majors participated in a longitudinal survey study (N = 546; 47% FGS). Students completed a survey three weeks into their first semester (baseline), and again at the end of the first and the second semesters. In every survey, they were asked to report their perceived faculty support, sense of belonging, and interest in science careers. Results revealed a significant interaction between perceived faculty support and generation status on students' sense of belonging at the end of the first semester, controlling for baseline levels (t = 2.00, p = .046). Simple slopes analyses showed that faculty support significantly predicted belonging for FGS (t = 3.93, p = .0001) but not CGS (t = 1.24, p = .214). Further, the conditional indirect effect of perceived faculty support on students' interest in science through belonging was significant only for FGS (b = .08, bootstrapped 95% CI .03 to .13) and not for CGS (b = .02, bootstrapped 95% CI -.03 to .07).

Previous studies have demonstrated that FGS experience greater belonging uncertainty in science (Harackiewicz et al., 2015). Our findings add to this work by highlighting the importance of faculty care and support during early college years, particularly for FGS. These findings suggest that faculty, especially those who teach first-semester science courses, should be motivated to convey care and support for their students.

232 11:30 am

Reading Outside the Lines: Can Prosocial Utility Value Connections in Science Textbooks Increase Science Engagement?

Jeanette Zambrano, Psychology (M)

Students who connect what they learn in their science courses to how those concepts can translate into helping others and serving their communities (or prosocial utility value) report greater subsequent science interest. This is especially true for underrepresented minority (URM) students because URM students find greater value in benefiting others through their work (Thoman et al., 2015). We hypothesized that students who read prosocial utility value content in science textbooks would experience increased beliefs that science affords opportunities to help others (prosocial science affordances). We expected that these beliefs, in turn, would predict greater science engagement, particularly for URM students.

We created four versions of a science textbook and manipulated the content to feature either prosocial utility value, non-prosocial utility value, interesting, or no (control) connections to science. Undergraduate students (N = 249; 54% URM) were randomly assigned to read one of the four textbooks. After reading, students answered questions about their interest in science and took a short quiz on the chapter. They also reported their perceived competence with the material prior to the quiz.

The interaction between experimental condition and ethnicity was only marginally significant (F = 3.06, p = .08). Looking within groups revealed that URM students who read the prosocial textbook reported greater prosocial science affordances (M = 5.33, SD = 1.40) than those who read traditional textbooks (M = 4.81, SD = 1.37), (p = .06). Moderated-mediation analysis suggested that these increased affordances predicted greater science engagement, controlling for their perceived competence (bootstrapped; 95% CI .01 to .41). Unexpectedly, a closer look revealed that well-represented students who read the prosocial textbook (M = 4.55, SD = 1.59) reported less prosocial science affordances than those who read the control textbook (M = 5.25, SD = 1.31); decreased affordances predicted lower science engagement, controlling for their perceived competence (bootstrapped; 95% CI -.27 to -.01). Though findings for URM students were consistent with predictions, the pattern among well-represented students was unexpected and inconsistent with previous studies, which found that prosocial connections boost interest for everyone (Brown et al., 2015). Current efforts to disentangle this discrepancy will be discussed.

233 11:45 am

Kindergarten Students: Predictors of Teachers' Perceptions on Student Science Knowledge and Skills in Classrooms with English Learners Melissa Navarro, Education (D)

Extensive research is conducted in higher education that has resulted on the recruitment of Latinos in science, technology, engineering and mathematics (STEM) majors; however little research has focused on K-12 science education for Latinos and English language learners (ELLs). In 2005, the United States had 10.5 million children who spoke a language other than English at home and were either immigrants or had immigrant parents. These children accounted for 20% of all American children in the ages of 5-17 and Latinos consisted of 14.5% of that population (Medvedeva, 2010). Even though Latinos are the fastest growing ethnic group in many states and will account for 25% of the US population by 2050, they are underrepresented in STEM fields compared to other ethnic groups (Taningco, Mathew, & Pachon, 2008). Moreover, research studies show that teacher effectiveness has a direct effect on student

academic achievement. According to the Tomás Rivera Policy Institute literature review, teachers play a major role in student achievement (Taningco et al., 2008). A way to look at the teacher's impact on their students' achievement is by analyzing teacher classroom practices related to science and teachers' perceptions of their students.

Using the Early Childhood Longitudinal Study of 2011 (ECLS-K: 2011) from the National Center for Education Statistics (NCES), the sample for this study included 2,472 kindergarten students who were in a classroom with teachers who reported having ELLs. The dependent variable, teacher reported science skill competence, is a composite variable consisting of the teacher rating students on how well students understand and apply seven science-related skills. The independent variables were selected following Astin and Antonio's (Astin & Antonio, 2012) I-E-O model and included a total of 18 variables, six input variables and 12 environmental variables. Hierarchical block multiple linear regression is employed to examine which variables significantly impact kindergarten teacher's perceptions on student science skills competence in classrooms with ELLs.

Nine significant predictors resulted from the regression. The three strongest predictors included income, child's home language is not English and teacher taught some type of science. Implications for teacher preparation and development will be discussed.

234 12:00 pm

Unraveling The Representations of a Transborder Cultural Identity for Transfronterizo College Students from the San Diego-Tijuana Border Region Vannessa Falcon, Higher Education (D)

The purpose of this photo voice study is to unravel the essence and underlying representation of a transborder cultural identity for transfronterizo college students from the San Diego-Tijuana border region. As transborder citizens (Iglesias-Prieto, 2011) transfronterizo college students' identities are significantly influenced by their transborder interactions in the transborder phenomenon. However, currently there is a paucity of empirical studies that have studied the identity development process of transfronterizo college students from the San Diego-Tijuana border (Falcon, 2013). As a result this study seeks to develop a transborder cultural identity development model grounded on the participants' thoughts, feeling and experiences about how their transborder interactions and socio-cultural environment shape their cultural identity.

235 12:15 pm

Closeness and Conflict: Teachers Perceptions of Kindergarten Girls

Darielle Blevins, Education (D)

This study seeks to determine if differences exist in teacher reported closeness and conflict among Kindergarten girls of various ethnicities and socioeconomic class. Additionally, researchers examined if there were differences in teachers

beliefs that children's behavior interferes with classroom teaching among kindergarten girls based on race and family income level using Black girls as a reference group. By centering Black girls in the conversation around teacher perceptions, researchers can further understand Black girls disproportionate representation in school discipline. Results indicated teachers did not differ in reported closeness to Black girls across income levels, nevertheless teachers reported higher levels of conflict and classroom interference for Black girls compared to girls of other ethnicities. This trend remained consistent for children from low and middle income backgrounds compared to scores of children from higher income backgrounds. Further research could examine perceptions girls hold about their behavior and about their relationship win their teachers. Implications for educators include anti bias influenced reflective supervision which allows educators to reflect on their core beliefs concerning race and gender as It relates to their daily classroom experiences.

Session B-9

Poster Presentation: Behavioral & Social Sciences P3 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

236 10:45 am

Relations among Parenting Strategies, Contextual Variables, and Child Problem Behaviors within Foster Families Daniel Barlam, Psychology (M)

There are 427,910 children in foster care (AFCARS, 2015). Of interest is how these children differ from their community peers considering their unique upbringing. In fact, foster children demonstrate behavior problems at much higher rates compared to non-foster children (Minnis et al., 2006). How might foster and kinship caregivers respond to these behavior problems? Few studies examine the relations between foster parenting strategies and child behavior problems (Galambos et al., 2003; Fuentes et al., 2014). How are variables such as kin or non-kin status of the foster parent, and other family contextual variables related to levels of child behavior problems? The purpose of this study was to examine the relations between parenting strategies, family contextual variables, and types of child behavior problems.

Participants included 344 foster parents (40.9% Hispanic, 36.1% Caucasian, 16.4% African American, 6.6% multi/other) who were part of a foster parent training intervention. Frequency for each type of parenting strategy was assessed during a baseline phone interview with caregivers using a previously used measure of parenting strategies. Responses were rated on a scale of 1 (Don't use this strategy) to 7 (3 or more times/ day). An average composite variable for items related to positive reinforcement was created. Child behavior problems were assessed using the Child Behavior Checklist (CBCL; Achenbach, 1991; internalizing and externalizing), with foster and kinship caregivers as raters.

Parenting variables related to each other at moderate levels, with values ranging from .167 to .302. Potential covariates (i.e., child age, parent age, number of months foster child in home, and number of children in home) related to parenting strategies at low to moderate levels, with absolute values ranging from .108 to .327. Parenting strategies positively correlated with the internalizing and externalizing broadband scales of the CBCL at moderate levels, with values ranging from .163 to .554. Based on these findings, linear hierarchical regressions will be used to determine the relation between parenting strategies and internalizing and externalizing child behavior problems, while controlling for behavior problems in each problem domain. Findings may inform our understanding of relations between parenting strategies and child behavior problems in foster families.

237 10:45 am

Child Behavioral Problems and Maternal Mental Health Kelly Gmeiner, Sociology (M)

Child behavioral problems and their treatment are the subject of a significant body of literature. However, less research has focused on the impact of child behavior problems on the

focused on the impact of child behavior problems on the health and wellbeing of their mother, despite the known toll of caregiving (Schaughency and Lahey 1985). Prior research shows child behavioral problems negatively affects maternal mental health (Civic and Holt 2000). I hypothesize that after analyzing the data we will find an association between the impact of child behavioral problems on maternal stress. I used data from the Fragile Families and Child Wellbeing Study ("Fragile Families") to determine the impact of child behavioral problems on maternal stress. I used data collected from the baseline through year five, with a sample size N=3,332. I used ordinary least squares regression to analyze the data. My outcome variable was parental stress, and my main predictor of parental stress was child behavioral problems. I looked at five different models that included variables such as mother's ethnicity, mother's highest level of education, mother's relationship status with the child's father, and the child's health. My results supported my hypothesis and showed a statistically significant association between child behavioral problems and maternal stress. Other variables that positively predicted maternal stress were mother's ethnicity, mothers who did not complete high school, and children who were not considered in good health. These findings are significant because it is important to recognize that a child's behavior can have negative repercussions for not only themselves, but those who care for them. Future research could look deeper into which child behaviors have a greater impact on maternal stress.

238 10:45 am

Maximizing Exposure Therapy: An Emphasis on Self-Efficacy Kylie Baer, Psychology (U)

There is ample evidence that exposure therapy is an efficacious treatment for anxiety disorders (Hofmann & Smits, 2008). However, its mechanisms of action are not well understood. Early approaches to exposure therapy proposed habituation (i.e., fear reduction) as the primary mechanism (Foa & Kozak, 1986). However, contemporary approaches propose inhibitory learning involving sustained fear and increased self-efficacy throughout exposures as the primary mechanisms (Craske, 2008). Perceived self-efficacy, defined as an individual's belief in his or her own capability to succeed in specific situations or accomplish a task, influences the power an individual actually possesses to face challenges competently (Bandura, 1994). In the context of anxiety-provoking circumstances (i.e. exposures), positive changes in perceived self-efficacy are related to improved adaptive responses (Zlomuzica, Preusser, Schneider, & Margraf, 2015). The goal of the current study was to determine whether self-efficacy was predictive of symptom reduction during exposure therapy in anxious individuals. We hypothesized that reduction in anxiety from before to after treatment during exposure therapy would be related to increase in self-efficacy. To examine this question, we assessed self-efficacy before and after treatment in 14 individuals meeting diagnostic criteria for either obsessive-compulsive disorder (OCD, n = 4) or social phobia (SP, n = 10). The program included four weeks of self-directed exposure therapy, with two clinical exposure sessions per week. We measured anxiety using the Obsessive-Compulsive Inventory (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998) for OCD patients and the Liebowitz Social Anxiety Scale (LSAS: Liebowitz, 1987) for social phobia patients. We measured self-efficacy using the General Self-Efficacy Scale (GSE; Jerusalem & Schwarzer, 1981). We found a significant correlation between self-efficacy and improvement, r = .58, p = .036, such that increase in self-efficacy was related to greater improvement during exposure therapy. The results suggest that efforts to enhance self-efficacy during treatment may result in superior response to exposure therapy.

239 10:45 am

Irritability as a Predictor of Depression Onset in At-Risk Adolescents Meghri Sarkissian, Psychology (U)

Objectives: To examine the predictive power of irritability on depression onset in a sample of at-risk adolescents.

Background: Irritability is a common characteristic of a variety of pediatric mental health problems including depression, anxiety, and oppositional and defiant behavior. Irritability has been identified as a major reason for treatment referral and associated with a range of negative youth outcomes. The current study aims to identify the impact of irritability in predicting onset of depression in a sample of adolescents at both familial and individual risk for depression.

Methods: The current study was a secondary analysis of a randomized prevention trial of 316 adolescents (M = 14.79 years, SD = 1.35; 59% female, 76% non-Hispanic White) at risk for depression. Adolescents were at risk by virtue of both familial (parental depression history) and individual factors (youth history of depression and/or current subsyndromal symptoms). Irritability was measured using a subscale of the parent-reported Conflict Behavior Questionnaire, a 20-item assessment of parent-youth conflict, collected at baseline. Explorations of subscale reliability and validity have suggested acceptable psychometric properties, supporting the use of this subscale to capture interpersonal irritability in internalizing samples. Depression onset was defined by the Depression Symptom Rating Scale, in which a score of > 4 across two or more consecutive weeks indicated onset.

Results: Baseline irritability significantly predicted depression onset at month 8, in that the odds of onset increased by 19% per point increase on the irritability scale (OR = 1.19, p<.001).

Conclusions: This preliminary exploration of irritability suggests that depression onset by month 8 is significantly predicted by baseline levels of interpersonal irritability. The final poster will include a survival analysis utilizing time to onset as outcome, as well as moderation analyses to explore potential interactions with enrollment in the prevention program.

240 10:45 am

Parents' Mental Health and Engagement in Their Children's Mental Health Treatment **Pui Cheng, Child & Family Development (M)**

This study aims to examine the relationships between the mental health of parents whose children present with disruptive behavior problems and parents' engagement in their children's mental health treatment. Disruptive behavior problems are commonly seen in children who receive community mental health services, and such problems can have a prolonged effect on child development. Many studies have examined the impact of the parents' mental health and parent engagement on children treatment outcomes, and more studies are needed to understand the relationships between parent mental health and parent treatment engagement. As parent engagement has a positive impact on children's treatment, the knowledge gained from this study can help to guide ways to increase parent engagement in children's mental health treatment through addressing parent mental health issues. There were 19 therapists and 20 parent-child dyads who participated in the study from five publicly funded community mental health clinics. Participants were from a pilot intervention study that examined the use of a parent participation toolkit. Therapists were 85% female and the average age is 35.6; parent participants were 90% female and the average age is 34.9; children participants were 80% male and the average age is 8.64. Participants were randomized to either use the toolkit as part of their treatment or use standard care (n=11 toolkit; n=9 standard care). Parents

completed depression and anxiety measures (PHQ-8 & GAD-7), and therapists completed an engagement measure about the parent and reported on session attendance. Parents' participation behaviors were coded from video recordings of sessions. Data are currently being analyzed and will be completed in February 2017. Multiple regression will be used to control for study condition and examine the associations between the predictor variables of parental depression and anxiety and the various parent engagement dependent variables. If the results are significant that parental depression or anxiety are predictors of parent treatment engagement, the findings can help further studies to focus on parents' mental health in children's treatment in order to increase parent treatment engagement.

Session B-10

Poster Presentation: Physical & Mathematical Sciences P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

241 10:45 am

Metal-Mediated Dimerization of a Designed Protein-Protein Interface Brian Maniaci, Chemistry (D)

Currently my research entails the de novo (from scratch) design of protein/protein interfaces by re-engineering (mutating) previously monomeric proteins to bind one another and form protein complexes with high affinity and specificity. The design of novel protein/protein interfaces is a relatively young field but one that my research has already significantly impacted. Our approach addresses two major concerns of protein/ protein design: weak binding and non-specific interactions. To tackle these issues we have engineered novel metal binding sites at the newly created protein interface. This approach recently resulted in the creation of a high-affinity, zinc-mediated protein homodimer. I have also engineered a library of rationally designed proteins that contain mutations in proximity to the metal binding sites. This iterative process is meant to continuously improve the affinity and specificity of the designed protein complexes. The goal is to explore and exploit key thermodynamic parameters that are essential for protein complex formation. The degree of association for the engineered complexes was analyzed using size exclusion chromatography combined with multiangle light scattering. These are techniques that separate proteins based on size and measure the degree of self-association by how they scatter laser light. What is really interesting about this work is that the proteins I engineered are completely monomeric in the absence of metal yet from high-affinity complexes (dimers) in the presence of metal. Thus this enables us to control matter (proteins) at the molecular level.

242 10:45 am

Modeling Phage-Bacteria Dynamics in Mucus: A Multiscale Approach to Phage Theraphy Kevin Joiner, Computational Science (D)

In our research, we believe phage therapy can be a promising and sustainable alternative to antibiotics. Accordingly, we have developed an agent based computational model of the E. coli bacteria and T4 bacteriophage in mucus. The model will be used to analyze three important aspects of phage therapy; phage encounter rates with bacteria, population dynamics and the bacteria-phage arms race. In the project's first stage, phage and bacteria encounters are analyzed using contact times during their stochastic motion. The phage's motion, due to its adherence to mucus, is described via a continuous time random walk with power law waiting times. The motion of the E. Coli is composed of alternating stages known as run and tumble, whose durations follow an exponential probability distribution. Encounters between the bacteria and phage are detected using a hand crafted multiscale collision algorithm. For the second aspect of our research, the simulations will include phage and bacteria lifestyles. To overcome the workload imposed by large population numbers and long timescales a dynamic, high performance computational environment will be used to simulate the bacteria-phage ecosystem. Our third goal is to extend the model towards evaluating the mutative abilities of phage in overcoming eventual bacteria resistance. Here, stochastic state variables in phage and bacteria cells will be used to evaluate the resistance of phage against bacterial evolution. Throughout the project, model calibration will be accomplished using empirical T4 and E. Coli data obtained from the Viral Information Institute at San Diego State University. If successful, our research will advance phage therapy as a viable method to destroy harmful bacteria.

243 10:45 am

Coral - Algae Wars: How are Invasive Algae Succeeding Against Coral? James Mullinix, Computational Science (D)

Climate change and human factors are severely affecting the health of coral reefs and favoring the success of turf algae over corals. We hypothesize that the geometry of corals affects the outcome of algal attacks. In particular, we compare the surface area of corals with its perimeter; the surface is where corals obtain nutrients, and the perimeter is the boundary where the algae are attacking. We expect that smaller perimeters and larger surface areas will lead to greater success rates for the coral. Several studies suggest that corals may exhibit fractal geometries, and we employ Richardson's algorithm and box counting to test the fractal nature of the perimeter and the surface. This process requires sorting points in 2D & 3D, which is analogous to the Travelling Salesman problem (TSP). We order the points using hierarchical clustering (HC). The enclosed images show the TSP solution via HC as well as the adaptive box counting method. Remarkably, we find that neither the perimeters nor the surfaces of the analyzed corals are fractal. Since the coral perimeters and surface

areas are not fractal, we use supervised Random Forest (RF) to determine the importance of these geometrical properties and other variables as predictors of coral success. Overall, the perimeter to surface area is a good statistical predictor. The relation is particularly robust for the subfamily *Faviinae clade* and *Siderastrea clade*. Thus, we show that in the length scales of millimeters to meters, corals are generally not fractal, and corals with small perimeter compared to their surface area will be at risk against algal attacks.

244 10:45 am

A Method of Energy Efficient Wireless Image Relay Unifying Application Content and Spatial Diversities Shuan He, Computational Science (D)

The total internet traffic is increasing at an enormous rate of 53% annually, posing significant challenges of network protocol design. Approximately 80% of the network traffic belongs to multimedia video, image and audio. On the other hand, mobile phones become the dominating wireless access network devices, and energy efficiency becomes a critical issue. To improve the mobile users' experience of service quality in the next generation of wireless networks such as 5G wireless systems, we study a new method to optimally relay multimedia contents with regards to energy efficiency consideration by exploring two diversities at both application layer and the physical layer: the application layer multimedia content diversity distribution and the physical layer antenna selection diversity. In this study we assume the feedback channel information is available at the mobile devices and the relay, and the Multi-Input-Multi-Output (MIMO) diversity gain in relay systems could be dynamically selected at the relay node. In the proposed relay transmission study, we utilize Quad tree fractal image compression method for image content preparation, and adopt the Alamouti space-time coding technique for diverse physical transmissions. The image content compression ratio is controlled by the traffic flow truncation and the MIMO antenna selection schemes is optimally adjusted with the feedback channel information, improving the image quality and the wireless communication energy efficiency. Simulation results show that with this unified application laver image content compression and physical layer antenna selection scheme, the relayed and received image quality could be improved and energy efficiency could be enhanced.

245 10:45 am

An Atroposelective Dynamic Kinetic Resolution of Di-Aryl Ether Naphthoquinones Through Nitromethylation

Andrew Dinh, Chemistry (D)

Atropisomerism is a form of chirality that arises from hindered rotation about a single bond due to bulky substituents adjacent to the bond axis. Depending on the energetic properties of the barrier of rotation, the atropisomers can exist as a rapidly interconverting mixture or a set of stable separable conformers. In the field of pharmaceuticals, synthetic control of all types of chirality is of utmost importance, as shown by the classic cases of thalidomide and perhexiline, where the unique enantiomers provide vastly different and sometimes dangerous effects. Likewise, the presence of atropisomers in many natural products, catalytic pathways and important biological scaffolds (i.e tyrosine kinase inhibitors) requires a development of new methods for atropselective synthesis.

One common procedure used to differentiate enantiomers in racemic mixtures is the dynamic kinetic resolution (DKR). A DKR is characterized by the epimerization of the stereocenter or bond, leading to a dynamic racemic mixture at all points during the reaction. The chiral reagent is added to selectively react with one epimer to convert all the starting material to the desired product. Despite these common methods, isolation of pure atropisomerically stable compounds is still an ongoing problem; for example, high performance liquid chromatography (HPLC) utilizing a chiral stationary phase will only give a maximum 50% yield. Recent scientific work has shown catalytic atropisomeric syntheses of di-aryl and di-napthyl systems; however, these projects ignore more pharmaceutically relevant scaffolds, specifically that of the diaryl ether. Herein, we propose an asymmetric synthesis to improve the efficient separation of biologically relevant atropisomers utilizing the methylation of a diaryl ether naphthoquinone scaffold. As a directing chiral group, we selected chichona alkaloid derivatives, which have been shown in the literature to be excellent catalysts for various enantioselective methodology. Optimized conditions have resulted in an enantiomeric ratio as high as 85:15 and conversions of starting material up to 70%. Ongoing work includes catalyst optimization and the expansion of substrate scope without the loss of selectivity.

246 10:45 am

Quasi-Dynamical Symmetries in Ab Initio Beryllium Nuclei

Ryan Zbikowski, Computational Science (D)

Recent advancements in supercomputers has provided researchers the ability to compute nuclear many-body wave functions with tens of billions of components. To digest this vast numerical information, we decompose nuclear wave functions according to symmetry groups. This gives rise to recognizable and persistent patterns over many states. These quasi-dynamical symmetries are especially pronounced along rotational bands. I apply these decompositions to ab initio calculations of Beryllium nuclei.

These observations suggest group theoretical decompositions represent an additional means of characterizing nuclear wave functions, expanding understanding of nuclear anatomy, and the possibility of compact symmetry-adapted many-body bases for future calculations.

Session B-11

Poster Presentation: Biological & Agricultural Sciences P1 Friday, March 3, 2017 10:45 am Location: Montezuma Hall

247 10:45 am

Developing Strategies to Target and Kill Cancer Cells Expressing the Wnt Receptor FZD7 Tanisha Takhar, Cell and Molecular Biology (M)

Cancer stem cells (CSC) are rare cells within a tumor that fuel the growth of a cancer, and eradication of cancer requires that these rare CSCs are specifically targeted and killed. However, the lack of CSC-specific markers has made it difficult to target and kill these cells. We have identified a cell surface marker, encoded by the FZD7 gene, which is highly expressed in several human cancers, including breast, ovary, and brain. Our previous research established an essential function for FZD7, a Wnt receptor, in human pluripotent stem cells. To further elucidate the function of FZD7 in stem and cancer cells, we have developed a highly specific antibody, which potently inhibits Wnt signaling activity and disrupts the pluripotent state. Because FZD7 expression is largely restricted to early developmental processes and is almost completely absent from normal adult cells, its expression in cancer makes it an ideal marker to identify and target CSCs. Using our unique FZD7 antibody, we are developing several strategies to attack cancer cells expressing FZD7. First, we have found that the antibody interferes with several properties of cancer cell lines, including proliferation, migration and clonogenicity. We are currently using this antibody to test whether FZD7 marks CSCs. Second, using standard antibody engineering methods, we generated a single chain antibody (scFv), which we have fused to a chimeric antigen receptor (CAR) that will be expressed in NK- and T-cells. These immune cells expressing the FZD7-specific CAR will be used to target human cancer cells in vitro and in vivo. The overall goal of these ongoing studies is to develop highly potent immunotherapies to target and kill cancers expressing FZD7.

248 10:45 am

Striding Towards the Generation of Hippocampal-Like Organoids Sarah Fernandes, Cell and Molecular Biology (M)

Three dimensional culture systems provide a physiologically relevant model for studying human brain development and disease. By directing the differentiation of human pluripotent stem cells (hPSCs) and supporting their intrinsic ability to self organize in three dimensions (3D), researchers have successfully generated organoids comprised of cells specific to several sub-regions of the brain; however, an organoid representing either the hippocampus or sub-regions of the hippocampus has yet to be developed. We aim to establish a 3D culture system that recapitulates the dentate gyrus (DG) structure of the hippocampus. Here we describe a screening platform which allows us to test compounds and growth factors hypothesized to influence the neural progenitor cells of organoids towards a DG fate. Immunohistochemistry analysis has revealed an increase in the expression of the DG specific marker Prox1 in directed organoids. Additionally, gene expression analysis confirms the upregulation of genes associated with cell types of the DG suggesting the acquisition of a hippocampal identity. Our research has great potential for serving as a model system to better understand the various neurological and psychiatric disorders affecting the hippocampus.

249 10:45 am

Development of skeletal muscle models of Emery-Dreifuss disease using human pluripotent stem cells Jesus Villanueva, Cell & Molecular Biology (M)

Skeletal muscle is a highly complex and heterogeneous tissue that accounts for more than 40% of the body's mass (Yin, Price, and Rudnicki 2013). The incapacitating and chronic loss of muscle during normal aging (sarcopenia), cancer (cachexia) and/or various genetic causes such as muscular dystrophies, is a problem that affects many people's life-span, quality of life and adds undue burden to societal cost. Through a

collaboration with Genea Biocells and the Bridges to Stem Cell Research Internship Program (BSCRIP), we present the development of a human stem cell model of skeletal muscle impairment due to Emery-Dreifuss muscular dystrophy (EMD). First described in the early 1900s, EMD is a genetic disorder characterized by a triad of contractures in Achilles tendons, elbows and cervical muscles, progressive muscular atrophy, and cardiac conduction defects (Emery 2000). The unique disease modeling platform at Genea Biocells takes advantage of the world's largest bank of human embryonic stem cells (hESC) and a robust, high-yield myotube differentiation protocol (Caron, Kher et al. 2016). Using previously banked disease-affected cell lines, the scalable myogenic differentiation protocol, high-content and oxidative stress screening platforms, we characterized and developed a clinically relevant skeletal muscle model for EMD.

250 10:45 am

The Cell Surface Adhesin BspC Contributes to Group B *Streptococcal Meningitis* Katilynne Vant Hul, Microbiology (M)

Streptococcus agalactiae (Group B Streptococcus, GBS) is a Gram-positive bacterium typically found within the human gastrointestinal and urogenital tract. GBS is currently the leading cause of neonatal meningitis due to its multiple virulence factors. In order to gain access to the central nervous system, GBS must penetrate the blood-brain barrier (BBB), which is composed of specialized cells known as human brain microvascular endothelial cells (hBMEC). The mechanisms of the BBB crossing are not well understood. We hypothesized that a member of the Antigen I/II family of cell surface anchored proteins, BspC, may promote GBS interaction with brain endothelium. Antigen I/II family proteins are known virulence factors that promote colonization of the oral cavity by other streptococci. To assess whether BspC contributes to GBS-BBB interaction, we performed allelic replacement of the bspC gene. Scanning electron microscopy revealed that the Δ bspC mutant exhibited altered surface appearance and decreased ability to interact with neighboring cells. To examine the role of BspC in the interaction of GBS with host cells we infected hBMEC with wild-type (WT) and the ∆bspC mutant and found that the mutant exhibited reduced ability to interact with endothelium. Further, using a murine model of hematogenous meningitis, we observed that mice challenged with the AbspC mutant exhibited a significant decrease in mortality and less bacterial brain loads compared to WT infected mice. These results suggest that BspC promotes virulence and BBB passage. Ongoing studies are underway to determine the exact mechanism of how BspC contributes to the pathogenesis of GBS meningitis.

251 10:45 am

Effects of alcohol intoxication on spontaneous neural oscillations are modulated by dopamine availability as a function of COMT Val158Met genotype

William Brocklehurst, Master of Arts in Psychology (M)

Spontaneous neural activity can be recorded during wakeful rest in the absence of any task demands. Alpha peak frequency (APF) is the frequency associated with the greatest power within the alpha band range (8-12 Hz). Prior research indicates that acute alcohol intoxication increases alpha power and slows APFs. However, the neural basis of these effects are poorly understood. Dopamine plays a key role in initiating and maintaining heavy drinking by reinforcing the effects of alcohol. Genetic polymorphisms can be used to examine the influence of dopamine availability on neural activity as a function of alcohol intoxication. Val158Met is the most commonly studied polymorphism within the COMT gene that regulates efficiency of catechol-o-methyltransferase (COMT), the enzyme that degrades dopamine. This study used multimodal imaging

to examine the effects of acute alcohol intoxication and dopamine availability on wideband oscillations measured during eyes-open and eyes-closed wakeful rest. Forty healthy young adult (M = 26.4, SD = 4.6) social drinkers with no personal or family history of alcohol or drug abuse were selected because of their homozygosity for the COMT Val158Met polymorphism. Met/met (high dopamine availability) and val/val (low dopamine availability) genotype groups were comprised of 20 participants each and matched for age, gender, and drinking levels. Alcohol and closing the eyes increased theta, alpha, and beta power in the medial supplementary motor area, occipital, and motor cortex regions. The met/met group had faster APFs than the val/val group in the pericalcarine region during the eyes closed condition. Furthermore, the met/met group had slower APFs during the alcohol session than the placebo session while the val/val group was unaffected by alcohol. Because of a higher dopamine availability in met/met carriers, these findings suggest that alcohol-induced alpha slowing is partly mediated by dopamine and that individuals with met/met genotype may be more susceptible to its deleterious effects.

252 10:45 am

The use of signature genes and motifs as a way of annotating viruses to improve viral description Dnyanada Pande, Bioinformatics and Medical Informatics (M)

Viruses are important in the biogeochemical cycling of the oceans and drive bacterial evolution; however, a majority of viruses cannot be cultivated. Metagenomics, a cultivation independent method helps in the studying of these uncultivable viral communities. The taxonomic and functional characterization of viruses and phages still remains a challenge because a significant proportion of viral metagenomes have low similarity with known viruses. Studies have identified certain conserved genes in some taxa that could be used to identify the presence of those taxa in unknown sequences. In this study I will investigate viral 'dark matter' by identifying viral signature genes and virus specific genetic motifs from viral metagenomes. Virus group specific signature genes will be used for homology searches to identify virus families. Protein motif databases that have known viral protein motifs and tools for de novo motif generation will be utilized. These methods will be used to see the increase in the number of unknown metagenomes that are annotated.

Session B12

Poster Presentation: Health Nutrition & Clinical Sciences P3 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

253 10:45 am

The Effect of Green Tea Extract on Fat Oxidation During One Hour Arm Cycle Exercise Eric Bartholomae, Dual Masters - Exercise Physiology & Nutritional Science (M)

Introduction: Decaffeinated Green Tea Extract (GTE) supplementation can increase fat oxidation during leg exercise. The purpose of this study was to investigate the effect of GTE supplementation on fat utilization during 1h arm cycle exercise. We hypothesized that GTE supplementation will increase lipolysis and fat oxidation.

Methods: This was a randomized, controlled, triple blind study with a crossover design. 8 healthy adults (4 females, 23-37yrs) performed an incremental arm cycle test to exhaustion followed by 4 time trials at fixed workloads. After an 8h fast subjects underwent 1h of arm cycling at 50% W_{peak}. Subjects were randomly assigned to either decaffeinated GTE (650mg, 611mg EGCG) or placebo (PLA) for 4wks. Subjects then repeated the 1hr arm cycle trial. A 4wk washout period was followed by the corresponding crossover trial. 5ml of blood were drawn pre and post exercise while respiratory gases were collected continuously. Plasma glycerol and free fatty acid (FFA) concentrations were assessed with commercially available analysis kits.

Results: Mean VO, during all 1hr trials showed no significant differences (.83-.89±.19-.25 L/min, p=.460). Similarly, mean total energy expenditure (EE) showed no differences across all trials (264.58 - 266.15 kcal, p=.420). The percentage of total EE from fat oxidation was higher after GTE supplementation compared to PLA, but this difference was not significant (22.83±11.57 to 25.38±11.3% vs. 23.39±9.97 to 20.69±8.9%, p=.532). There were no significant changes in g/min of fat oxidized between treatments before and after supplementation (GTE=.11±.08 to .12±.06 vs. PLA=.10±.05 to .09±.04, p=.220. Blood Glycerol concentration increased post exercise in all trials, with no significant differences between treatments (8.55± 3.44mg/dl to 8.47±2.6 vs. 10.05±2.86 to 8.99±3.51 mg/dl, p=.527). FFA concentration was also increased post exercise for both groups with again no significant difference between treatments (8.30±3.8 mg/dl to 8.69±2.59 vs. 9.06±4.49 to 7.16±3.79, p=.234).

Discussion: These results suggest that there is no effect of 1m GTE supplementation on lipolysis and fat utilization during 1hr arm cycle exercise at 50% $W_{_{\rm peak}}$.

254 10:45 am

Locus of hunger and amygdala activation to a sweet taste in Hispanic young adults Jacquelyn Szajer, Clinical Psychology (D)

Hispanic ethnic groups have been shown to consume higher amounts of sugar-sweetened foods and to have a higher risk for health conditions associated with high dietary sugar levels (e.g., diabetes, metabolic syndrome), both of which are associated with changes in brain activation and greater risk for cognitive decline and neurodegenerative disease in aging. Taste is a determinant of food preference and palatability, and an important predictor of diet. Research has shown differences in brain response to visual food cues among Hispanics, but little research exists on differences in response to taste. We examined differences in fMRI activation during the hedonic evaluation (i.e., pleasantness rating) of a sweet taste (sucrose) between 16 Hispanic and 16 non-Hispanic young adults, during a hunger state. fMRI data were collected at the UC San Diego Center for fMRI using a 3T-GE-MR-750 scanner. Taste stimuli were administered orally and rated for pleasantness on a modified general Labeled Magnitude Scale (gLMS) using a joystick to place a crosshair over the selected rating number on the gLMS, which is projected onto a screen and visible to the participants via a mirror. The Three Factor Eating Questionnaire (TFEQ) was administered to assess hunger and eating behavior. Hispanics had significantly lower left amygdala activation (p = .028) and significantly lower scores on TFEQ Scale3 (the Locus of Hunger scale) than non-Hispanics (p = .001). Within-group exploratory correlations revealed a significant direct correlation between Locus of Hunger and left amygdala activation, but only in the Hispanic group (p = .01). Ethnic differences in brain activation to rewarding tastes have important implications for diet and eating behavior, especially considering the increased risk for insulin-related dysfunction among Hispanic populations, and associated increased risk for cognitive decline and Alzheimer's disease in aging.

255 10:45 am

Aramchol as Treatment for HIV-associated nonalcoholic fatty liver disease and lipodystrophy Keagan Casey, Public Health (U)

Background: Liver disease is a leading cause of death in patients with human immunodeficiency virus (HIV). 20-30% of adults are affected by nonalcoholic fatty liver disease (NAFLD) in the US. Nearly 30% of NAFLD cases result in hepatocellular carcinoma. There is no treatment for HIV-associated NAFLD. Our aim is to examine the efficacy of Aramchol in hepatic steatosis, total body fat and ALT & AST levels.

Methods: This is a double-blinded, placebo-controlled clinical trial in which we propose to randomize 50 patients (males/ females over 18 years with HIV-associated NAFLD). Patients with HIV are screened at the UCSD NAFLD Research Center with medical history, physical examination, and blood tests. Patients receive a liver MRI, ultrasound transient elastography with CAP, and DEXA scan. Patients with an MRI-PDFF of >5% are randomized to 600mg of Aramchol per day or placebo over a 12-week period. A two-tailed t-test will compare the differences in fat fraction between both groups.

Expected Results: 22 patients are enrolled. We predict that the Aramchol will reduce liver fat by 6%, compared to the spontaneous improvement rate of 0 to <1%.

Conclusions: The study is ongoing and recruiting. Results and conclusions will be reported upon completion.

256 10:45 am

Watermelon and Arginine Supplementation Alter Serum Lipid Profile, Inflammation, and Oxidative Stress in Rats by Regulating Gene Expression Joshua Beidler, Exercise Physiology and Nutritional Sciences (M)

L-citrulline is an amino acid, abundant in watermelon, that may reduce the risk of cardiovascular disease (CVD) by increasing endogenous production of nitric oxide. The goal of this study was to investigate the effects of watermelon powder and L-arginine on blood lipids, antioxidant capacity, and inflammation in rats consuming a high-fat diet. The hypothesis was that both interventions would reduce cardiovascular risk by regulating liver expression of genes related to lipid metabolism. For 9 weeks, male-weanling Sprague-Dawley rats were fed diets containing either 0.5% watermelon powder (n = 11), 0.3%L-arginine (n = 11), or a control diet (n = 10). Results showed that serum concentrations of triglycerides, total cholesterol, low density lipoprotein cholesterol, and C-reactive protein were significantly reduced in the watermelon and arginine groups (P< .05), while superoxide dismutase, glutathione S-transferase, and total antioxidant capacity were increased (P<.05). Rats fed watermelon and arginine also exhibited upregulation of endothelial nitric oxide synthase (P<.05) and downregulation of fatty acid synthase, 3-hydroxy-3-methyl-glutaryl-CoA reductase, sterol regulatory element-binding protein 1, sterol regulatory element-binding protein 2, cyclooxygenase-2, and nuclear factor NF-kappa-B p65 (P< .05). The results support the hypothesis that both watermelon and L-arginine reduce CVD risk by altering liver gene expression related to lipid synthesis, inflammation, and oxidative stress.

257 10:45 am

Mixed nut consumption yields rapid improvement of lipid profiles, oxidative stress, and total antioxidant capacity in atherogenic-diet fed rats Shauna Groven, Nutritional Sciences (M)

While cardiovascular disease (CVD) is now the first-leading cause of death in the U.S., its primary cause is atherosclerosis, which commonly results from LDL-cholesterol oxidation. Previous studies have demonstrated nut consumption decreases CVD risk by improving blood lipid profiles; however, limited research exists concerning the effects of nut mixture consumption in regards to CVD prevention. Therefore, this study aimed to determine the effects of mixed nuts on lipid profiles, glucose, oxidative stress, and antioxidant capacity in rats fed atherogenic diets. Thirty male Sprague-Dawley rats (21-days old) were randomly divided into three groups (n=10) based on initial body weight, consuming either an isokilocalorie control diet (no nut), 8.1% pistachio diet (single nut), or 7.5% mixed nut (almonds, cashews, pecans, pistachios, walnuts, peanuts, macadamia nuts, and brazil nuts) diet for 8 weeks. Initial and final body weight, weight gain, and daily food and water intake were measured. After 8 weeks, rats were euthanized and liver, spleen, and epididymal fat were collected and weighed. Blood serum was collected for triglyceride, total cholesterol, HDL-cholesterol, glucose, albumin, oxidative stress, and total antioxidant capacity assessment. LDL-cholesterol was calculated using HDL-cholesterol and triglyceride values. Initial and final body weight, weight gain, and daily food and water intake were not statistically different between groups. Both pistachio and mixed nut groups significantly decreased triglycerides (p=0.023), total cholesterol (p=0.037), LDL-cholesterol (p=0.010), and oxidative stress (p=0.014), and increased total antioxidant capacity (p=0.046) compared to the control group. No significant differences in organ weights, blood glucose, albumin, or HDL-cholesterol were found between groups. No significant differences existed between pistachio and mixed nut groups. Since the mixed nut diet yielded equivalent results to the pistachio diet, this study suggests mixed nut consumption can effectively reduce risk of CVD development.

258 10:45 am

The relationship between diet-related chronic disease diagnosis and fruit and vegetable consumption

Lorraine Pulido, Foods and Nutrition (U)

Increasing fruit and vegetable (F&V) consumption is advocated by the World Health Organization for adults as a preventive measure against certain chronic diseases. In recent years, increasing F&V consumption has also been a part of the medical nutrition therapy for adults who with a diet related chronic disease.

The El Valor de Nuestra Salud study was a 5-year research study designed to evaluate a grocery store-based intervention that aimed to promote F&V consumption among Latino adults. In our current study, we will examine baseline interview data that included 369 Latino adult customers from 16 participating Latino grocery stores in San Diego County. We will examine whether participants with a self-reported diagnosis of a diet-related chronic disease are more or less likely to consume F&V compared to healthy participants. For the purpose of this study, diet-related chronic disease is defined as being diagnosed with any of the following: diabetes, high blood pressure, heart disease, high cholesterol, history of stroke or heart attack, or a combination of these diseases. A healthy individual is defined as someone who did not report any health conditions during the interview.

The final study sample is 363 after excluding 6 participants who were dropped due to missing information. Our preliminary results showed that 42% (n=153) of the sample was diagnosed with at least one diet-related chronic disease and 45% (n=165) reported no health conditions. An additional 45 (12%) participants who reported only non-diet-related health conditions were excluded from further analyses. The mean F & V consumption among those diagnosed with diet-related chronic disease(s) was 1.48 cups of fruits and 1.02 cups of vegetables. The mean consumption for healthy participants was lower for fruits (1.35 cups) but higher for vegetables (1.14 cups) compared to those who were diagnosed with a diet-related chronic disease.

Session B13

Poster: Behavioral & Social Sciences P4 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

259 10:45 am

Leptin Levels in Middle Age Adults with Metabolic Syndrome Versus Middle Age Controls

Ilex Beltran-Najera, Psychology (U)

Metabolic Syndrome (MetS) can be characterized by 3 of 5 cardiometabolic risk factors including: high blood pressure, high triglyceride level, low HDL cholesterol level, raised fasting glucose, and abdominal obesity. Increased food intake is an important factor in the development and maintenance of MetS. The process of food initiation and termination is dependent on the regulation of several hormones. The gut hormone leptin has been shown to be important in satiation, neuronal communication, and potentially in holding neuroprotective properties. The purpose of the current study was to investigate the potential for differences in leptin in middle age adults with MetS and controls. Participants were 10 middle aged adults with MetS and 11 without MetS. We investigated baseline leptin levels after fasting for 24 hours as well as the effects of a caloric intake (preload) on leptin levels after the fast. The metabolic manipulation enabled the comparison between the effects of MetS on baseline levels of leptin along with the effects of MetS on hormone changes after the preload. Results showed that middle aged adults with MetS had significantly higher leptin levels during the fasting stage (p = .038) in comparison to healthy middle aged adults. We speculate that there is inefficient functioning of the central satiety system in MetS. With the rise in obesity prevalence and neurodegeneration prevalence, it will be increasingly important to consider hunger and satiety hormones in the investigation of healthy aging in the human brain.

260 10:45 am

Sensory abnormalities are linked to deficits in social communication in children with autism spectrum disorders

Ellyn Pueschel, Psychology (U)

Autism spectrum disorders (ASDs) are a range of neurodevelopment disorders with core symptoms involving impairments in social communication, as well as repetitive and restricted behaviors. A growing body of evidence, however, suggests that atypical sensory processing is also highly prevalent in children with ASDs. While guestionnaires such as the Sensory Profile capture abnormalities in sensory behavior via caregiver report, it remains unknown how these measures relate to symptom severity. We hypothesize that children with ASDs who have more severe sensory processing issues will also show greater symptom severity in the core domains. To examine this, in-house data from children and adolescents with ASDs (n=34) and typically developing (TD) peers (n=37) matched in age, gender, and handedness were collected. Sensory behaviors were assessed using the Sensory Profile (SP) care-giver questionnaire, which organizes sensory symptoms in terms of a child's response to input from the different sensory systems. Scores indicating low registration, or a lack of response to sensory input, were used to subdivide the ASD cohort into "moderate" and "severe" subgroups. Statistical analyses were run to compare measures of autism symptomatology, including the Autistic Diagnostic Interview (ADI) and the Social Responsiveness Scale (SRS), between the three groups. An Analysis of Variance (ANOVA) of SRS sub-scores showed a main effect of group; independent samples t- tests indicated significant differences between the severe ASD subgroup and the TD group, as well as between the moderate ASD subgroup and the TD group. Results further showed significantly higher ADI communication, SRS autistic mannerisms, and SRS communication sub-scores in the severe ASD subgroup as compared to the moderate ASD subgroup. These findings suggest that differences in the sensory behaviors of children and adolescents with ASDs are reflected in symptom severity. In particular, increased sensory abnormalities appear to be linked to greater deficits in social communication. This behavioral link may be further explored in functional connectivity patterns in the brain.

261 10:45 am

Atypical development of the corpus striatum in children and adolescents with autism spectrum disorder

Sanjana Punyamurthula, Psychology (U)

Background: Autism spectrum disorder (ASD) is a developmental disorder characterized by deficits in social and communicative function and by the presence of restricted and repetitive behaviors and interests. The corpus striatum is known to play a role in repetitive motor behaviors in a number of neurological disorders, and increased volumes of the corpus striatum have been reported in individuals affected with ASD. It has also been demonstrated that overall brain growth is accelerated in young children with ASD, but atypically slow in older children, often leading to conflicting findings depending on the age group examined. Therefore, differences in striatal volume may not be consistent between age groups. Objective: To test for anatomical differences in the corpus striatum in children and adolescents with ASD when compared to matched neurotypical samples, and to test for relationships between these volumes and measures of repetitive behaviors. Methods: Magnetic Resonance Imaging was collected from 50 subjects, with volumes of striatal structures (putamen, pallidum, accumbens, and caudate) extracted using FreeSurfer. Participants were separated into diagnostic and age groups (children: ages 7.64-12.92 years; adolescents: ages 13.0-17.98 years). Subjects were group-matched on age, IQ, handedness, and gender. A preliminary sample of 25 ASD participants (12 children, 13 adolescents) and 25 TD participants (12 children, 13 adolescents) were analyzed using SPSS. Results: A significant group-by-age interaction was found for volumes of left accumbens, F(1,46)=5.00, p=.03, and right accumbens, F(1,46)=5.58, p=.02. Volumes in both hemispheres were higher in the ASD than the TD group among children, but lower in the ASD group among adolescents. No other significant effects were found. Conclusion: The predicted interaction between subject group and age was found only for the nucleus accumbens. This is partially consistent with previous findings of increased striatal volumes in ASD, and findings of atypical growth trajectories for several brain structures. Atypical development of the nucleus accumbens is likely to contribute to the repetitive motor behaviors that occur in ASD. A planned increase in our sample size will provide additional statistical power and may reveal additional effects. Additional work will include tests for correlations between brain measures and scales of repetitive behaviors.

262 10:45 am Mortality and Olfactory Response Bias Paul Wheeler, Psychology (M)

Introduction: The current study investigated whether mortality predicts differences in odor memory in older adults and whether the age group of participants affects odor memory differences.

Methods and Procedures: 40 older adults (20 women; 20 men) participated in a longitudinal study at San Diego State University. The mean age was 72.5 (SD = 7.16; range 62 -87). A median split was utilized to classify adults into the older (73 - 87) or younger (62 - 72) conditions. 16 participants were ApoE4 positive (40%) and 24 were ApoE4 negative (60%). Participants were assessed utilizing the California Odor Learning Test (COLT). The COLT is a 16-item odor memory test that consists of measures related to odor learning such as response bias, correct rejections, and false positives. A follow up study was conducted with death information obtained from the public record.

Results: Upon follow up, 19 out of 40 (47.5%) participants had passed away. No significant differences were found between mortality and average age. An ANCOVA revealed differences

in response bias for those living compared those who passed away after testing (p < .01). Covariates included age, gender, dementia rating scores, and ApoE4 status. Older participants, who were deceased upon follow up, had the most response bias on tasks of odor learning (p < .001).

Conclusions: Mortality is associated with increased response bias of odor learning and memory in older adults over the age of 72. This has implications for which factors of olfaction might be associated with increased mortality.

263 10:45 am

Irritability and Amygdala-Ventral Prefrontal Cortex Connectivity in Children with High Functioning Autism Spectrum Disorder

Cynthia Kiefer, Psychology (M)

Background: Irritability is a common, highly impairing symptom among youth with high functioning autism spectrum disorder (HF-ASD) and predicts long-term adverse outcomes. Impaired processing of emotional faces, found in both autism and irritability, may lead to inappropriate social responses. Indeed, amygdala hyperactivation elicited by emotional faces has been found in autism and irritability in other diagnoses (i.e., bipolar disorder, disruptive mood dysregulation disorder). Yet, little is known about the neural correlates of irritability in HF-ASD, nor how other brain regions within amygdala networks may relate to irritability within HF-ASD. To characterize neural correlates of irritability in HF-ASD, this study investigated amygdala functional connectivity.

Methods: Children with HF-ASD (N=33, aged 8-19 years) performed an implicit face emotion processing task during fMRI acquisition, in which participants identified the gender of faces with happy, sad, fearful, and neutral expressions. Whole-brain amygdala functional connectivity across emotions was calculated for each individual and correlated with an irritability-like measure, the Aggressive Behavior subscale of the Child Behavior Checklist (CBCL), which includes items (e.g., "temper tantrums or hot temper") shown to comprise an irritability factor conceptualized as low threshold for anger.

Results: Whole-brain analyses revealed alterations in right amygdala to ventral prefrontal cortex functional connectivity, which correlated with the irritability-like subscale of the CBCL. Worse irritability-like symptoms related to greater amygdala-prefrontal cortex connectivity (xyz=34,62,-2, t31=3.12, p<.05, k=80).

Conclusions: Results suggest that the neural substrates of irritability in HF-ASD include amygdala-prefrontal cortex dysfunction, providing evidence that faces may elicit emotion dysregulation in autism, which may lead to irritability.

264 10:45 am

Altered neural habituation to emotional faces in pediatric and adult bipolar disorder

Maria Kryza-Lacombe, Clinical Psychology (D)

Background: Failure to habituate to repeated presentation of emotional faces has been shown to contribute to socioemotional symptoms. Previous research indicates that children and adults with bipolar disorder (BD) show behavioral deficits in face emotion processing including abnormal prefrontal cortex and amygdala activation. However, no study had yet examined neural habituation to emotional faces in BD. Moreover, despite evidence that BD differs across the lifespan, little work has compared neural profiles of pediatric vs. adult BD.

Methods: Adolescents (n=24; mean age=16.5 years, SD=2.4) and adults (n=33; mean age=38.2 years, SD=11.1) with BD as well as healthy adolescents (n=29; mean age=15.1 years, SD=2.4) and adults (n=22; mean age=29.4 years, SD=7.2) performed a face emotion-labeling task during functional magnetic resonance imaging acquisition.

Results: Whole-brain analyses revealed Diagnosis x Age interactions predicting habituation of medial prefrontal cortex (xyz= 6,41,43; k=61; F1,101=13.67, p<.05 corrected) and lingual gyrus (xyz= 1,-79,-6; k=42; F1,101=16.11, p<.05 corrected) to emotional faces. Post-hoc comparisons revealed that whereas healthy youths decrease in activation with repeated presentation of faces (i.e., habituate), youths with BP increase in activation (i.e., sensitize). Adults (healthy and with BP) did not significantly change in activation over the task. There was also a trend for Diagnosis x Age in the amygdala region of interest (p=.08).

Conclusions: These findings demonstrate that altered habituation to faces may be involved in pediatric BD. The results furthermore suggest that adult and pediatric BD may involve different neural mechanisms. These results have implications for facilitating developmentally sensitive diagnosis and treatment for BD.

Session B14

Poster Presentation: Interdisciplinary P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

265 10:45 am

The Kingdom of Cambodia: Political Corruption & Policy Effectiveness Kelsey Pickert, Communication (U)

This research examines the post-conflict policy responsiveness of the Kingdom of Cambodia and how the presence of corrupt government officials influences the policy effectiveness. I argue that post-conflict policies have been effective in combating post-conflict socioeconomic disorder, yet the presence of corrupt government officials have minimized the potential scope of influence. Utilizing qualitative methods for an intensive case study analysis, I draw upon qualitative and quantitative data sources, including official government reports, personal citizen statements, scholarly research, expense reports, citizen satisfaction surveys, and national demographic data. I find a relationship between the presence of political corruption and policy effectiveness. Specifically, I find that the presence of government officials acting for a political party or personal interest through embezzlement, strategic ambiguity, and scare tactics decrease policy effectiveness and political efficacy amongst Cambodian citizens.

266 10:45 am

Structural Bioinformatic Analysis of Phage Capsid Proteins as Environmental Indicator Dechao Zhu, Biochemistry (U)

The goal of this project is to use structural bioinformatic tools to analyze environmental phage data from the SDSU PhAnToMe database to identify protein structural elements that could act as metrics for environmental conditions, such as salinity and microbialization. The methods include generating 3D structural models of phage major capsid protein sequences from environmental samples, and building a web based data management platform for sorting and linking the structural and genomic data to create a unified and mineable data bank for comparative analyses. The resulting platform is PhagePort, a user-friendly portal that facilitates analyses such as correlating conservation patterns in primary and tertiary structure with specific environmental parameters. Preliminary analysis using this portal shows that 600 distinct proteins from an environmental sample adopt the common HK97 fold characteristic of major capsid proteins. PhagePort will be available to all SDSU students and faculty and will enable future analyses such as correlations of protein surface electrostatic potential and environment salinity in a more organized and accurate way.

267 10:45 am

A Total Chemical Synthesis of Micromide Nicholas Hernandez, Biology (U)

Micromide is a novel lipopolypeptide isolated from the Symploca genus of cyanobacteria in Hawaii. Micromide is composed of five N-methylated amino acids with a modified thiazol tail piece and a B-methoxyhexanoic acid head piece. This secondary metabolite shows cytotoxicity of IC50 in pico-molar concentrations against KB cells. The structure of the product proposed by Williams et. al is suppected to be incorrect1 because the chiral amino acids are subjected to acid hydrolysis during the peptides characterization. The Bergdahl group strives to propose an effective synthesis for micromide in which the true structure may be elucidated. Our presentation suggests a route to the peptide using solidphase peptide synthesis and F-moc protected amino acids. N-Me-Phe-L-Fmoc is dissolved in DCM/DMF and coupled to CTC resin using DIPEA. Subsequent deprotection using 20% piperidine in DMF affords the free amine which is reacted with the next amino acid. This general procedure is replicated to grow the peptide as follows: Phe-Ile-Val-Val-Phe. The C-termal is then coupled to 3- methoxyhexanoic acid using DIC in DMF. This peptide is then removed from the resin using 20% HFIP in DCM. Next the N-Me-thiazol is coupled to the N-terminus of the molecule using HATU and DIPEA to yield the product. Using enantiomers of the amino acids present in microcmide in our synthesis we can construct various epimers of micromide and compare them to the proposed structure of the natural product using 1H NMR. Once the structure has been corrected micromide will be produced in a significant amount for biological testing to determine its biochemical efficacy.

268 10:45 am

Kinetic Resolution of α-Substituted Aldehydes via Vinylogous Mukaiyama Aldol Reaction Brent Thomas, Chemistry (M)

Purification of enantiomers has long been established by the common techniques of recrystallization, chiral column chromatography, and chiral agents. Kinetic resolution, an indirect form of purification, occurs when one enantiomer of a racemic mixture reacts faster with a chiral substrate thus leaving behind a purified enantiomer. During the implementation of the vinylogous Mukaiyama aldol reaction (VMAR) to construct fragments of lagunamide A, it was observed that there was a stereochemical preference for reactivity of (S)- vs. (R)- α -substituted aldehydes. This project was envisioned after observing a potential application for the kinetic resolution of α -substituted aldehydes via VMAR. Enantiomerically pure (R)and (S)- α -substituted aldehydes are commercially available, but at an increased price compared to a racemic mixture. This method may provide an economic route to optically pure α -substituted aldehyde enantiomers when other forms of purification are inept. In order to test the scope of this kinetic resolution project, various α -substituted aldehydes are being synthesized and the enantiomeric excess is being analyzed after the resolution process. Initial studies have shown promising results using a racemic mixture of 2-methylbutanal where the (S)-enantiomer reacted preferentially with the chosen chiral auxiliary to provide a product diasteriomeric ratio (d.r.) of (97:3) at 10 minutes reaction time. Increased reaction time provides a slightly diminished d.r. of (85:15) at 18 hr. These preliminary results have given haste to understand the scope of using the VMAR protocol as an effective tool for the kinetic resolution of α -substituted aldehydes.
Session B15

Poster Presentation: Biological & Agricultural Sciences P2 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

269 10:45 am

Identification of Cell Surface Markers on Lung Progenitor Cells expressing NKX2-1

Rachael McVicar, Biology (U)

The mortality rate of infants with pediatric lung diseases is 16.2% in the US. One condition, neonatal respiratory distress (RDS) syndrome, is caused by the insufficient production of pulmonary surfactant in distal lung epithelial cells, the alveolar type II cells (ATII), which leads to increased surface tension at end expiration, and occurs in preterm infants with arrested lung development. Cystic fibrosis is a proximal lung epithelial in disease that currently has no cure and affects 30,000 individuals. These diseases are difficult to study because the lung has 40 different cell types which are difficult to isolate and obtain from a human patient. Human induced pluripotent stem cells (hiPSCs) enables the study of particular cell types can be isolated by surface marker expression and then studied in vitro.

Our hypothesis is to differentiate lung progenitor cells (LPCs) from hiPSCs in order to study early lung development, and discover surface markers that define critical lung cell populations that reside in the proximal and distal portions of the lung.

Using published and novel protocols for embryonic lung development, we differentiated hiPSCs into definitive endoderm, anterior foregut endoderm and lung progenitor cells (LPC) using a cocktail of growth factors and small molecules. LPCs express high levels of NKX2-1 and this expression correlates with increased expression of the cell surface antigen Carboxypeptidase M (CPM). To isolate LPCs for further lung differentiation, we used positive selection for NKX2-1/CPM expressing cells through the use of a multifaceted comparative proteomic approach. We used in vitro screening of 300+ cell surface antigens in collaboration with the UHN monoclonal antibody core facility to discover surface markers that co-expressed CPM. The "top hits" generated will be further explored in order to characterize distal and proximal lung tissues derived from LPCs. We will then use RNA seq to define the genetic signature of the sorted cell types using the novel surface markers which will allow the creation and isolation of specific lung cells in which to study various pediatric lung diseases.

270 10:45 am

Modeling of Myotonic Dystrophy Type I With iPSC Derived Skeletal Muscle Stem Cells Alicia Razo, Biology (U)

Myotonic dystrophy type I (DM1) is an inherited muscular dystrophy characterized by a CTG repeat expansion in the 3' untranslated region of the DMPK gene. This expansion results in the expression of a poly(CUG) RNA which sequesters the splicing factor MBLN1 leading to aberrant splicing events. and may be translated into toxic protein species. We derived iPSCs from DM1 patient fibroblasts and differentiated them into skeletal muscle cells. DM1 muscle cells show the expression of toxic poly(CUG) RNA which can be visualized by FISH as RNA foci in the cell nucleus. One therapeutic approach for DM1 is to prevent the expression of the poly(CUG) RNA by blocking transcription of the expanded DMPK gene using a pyrrole-imidazole polyamide (DM1-4) that targets CTG repeats. Preliminary results show reduction of RNA foci in DM1 skeletal muscle cells treated with DM1-4. We have also identified alternative splicing events in iPS-derived DM1 muscle cells compared to unaffected muscle cells and future work will establish whether polyamide treatment will restore these splicing defects.

271 10:45 am

Characterization of adult-like skeletal muscle differentiated from human pluripotent stem cells Joe Rodriguez, Biology - General (U)

Skeletal muscle (SkM) comprises 40-50% of the human body mass and serves vastly important functions such as the ability to provide locomotion, respiration and metabolic control amoung various others. There are many diseases associated with muscle loss which can be caused by normal aging (sarcopenia), cancer (cachexia) and genetic mutations (muscular dystrophies). Treatment options for muscle diseases are very limited and the loss of normal muscle function affects patient's quality of life, independence and for some diseases their lifespan, thereby presenting a significant burden to society and healthcare systems. Human pluripotent stem cells (hPSC) differentiated to SkM enables the development of muscle disease models as a tool for drug discovery or cell therapeutic approaches. Genea Biocells developed and published a robust, scalable and efficient protocol for producing SkM from hPSC. A common general limitation of human stem cell models is the still embryonic nature of the resulting cells which was also observed for hPSC-derived SkM. In more recent research we conducted high-throughput screens to address this shortcoming and to make more mature, adult-like SkM. This has to the discovery of compounds that improve MyoD positive cell formation and myoblast fusion to multinucleated myotubes. The resultant muscle cells are morphologically similar to that

of primary myoblast cultures. The maturity and contractile ability of hPSC-derived skeletal myotubes produced using this improved method was assessed using readouts including action potentials (multi-electrode arrays, Calcium imaging), spontaneous contraction and pharmacological regulation of contraction. These parameters will be useful measures to study muscle related diseases, to identify disease phenotypes and to evaluate the mechanism of action and efficacy of drug leads.

272 10:45 am

Enhancement of Neuraxis Coverage of Multipotent Human Neural Stem Cells using Fucosylation and SDF-DV1 for in vivo Transplantation Studies Garland Jackson, Biochemistry (U)

Amyotrophic Lateral Sclerosis (ALS) is a degenerative motor neuron disease that leads to early death with no currently effective treatment options available. Stem cell transplantation studies of mouse models have observed that the multiple pathologies associated with ALS can be alleviated using human neural stem cells (hNSC) however their effectiveness is dependent upon the extent of neuraxis coverage and is limited by the invasiveness of therapeutic procedures. For every 1 unit increase in the number of regions covered there is a 30% decrease in risk-of-death ratio. To enhance this neuraxis coverage we propose three minimally invasive procedures to improve the pathophysiological outcomes of SOD1G93A model mice. The first being fucosylation of hNSC using alpha-(1,3)- fucosyltransferase (FT-VI) to enhance vascular homing and engraftment of intravascularly transplanted cells. The second using the synthetic peptide SDF-DV1, a detoxified version of the SDF-1a chemokine, to maximize the pathotropic benefits of this peptide while simultaneously mitigating the host's inflammatory response in intraspinally transplanted cells. The final method is to assess if a positive, synergistic effect occurs from the combination of the previous methods. Using histological and immunocytochemical assessment, in vivo bioluminescent imaging, behavioral and motor assessments, and electrophysiological studies we seek to determine the extent to which fucosylation of hNSC does indeed enhance the transmigration of intravascularly transplanted cells above the normal observation of 5% engraftment by untreated cells and what optimal dosage of FT-VI is needed to achieve this. We are also in the process of performing intraspinal transplantation of hNSC via laminectomy procedures using stereotactic surgical equipment to determine if, and how much of, the synthetic peptide SDF-VI increases the extent to which the neuraxis is covered. How effectively these procedures work to improve the symptoms of these ALS model mice will determine the potential for use in patients afflicted with this debilitating disease.

273 10:45 am

An induced pluripotent stem cell (iPSC) model to study mechanisms of non-alcoholic fatty liver disease (NAFLD) associated with PNPLA3 polymorphisms in human hepatocytes Itzel Navarrete, Biology with Emphasis in Cellular and Molecular Biology (U)

Non-alcoholic fatty liver disease (NAFLD) is the leading cause of chronic liver disease in the adult and pediatric population. Genome-wide association studies (GWAS) have identified a polymorphism in the gene PNPLA3 that has a strong association with risk and severity of NAFLD. Using TAL effector nuclease (TALEN) technology, we generated isogenic lines from human induced pluripotent cells (iPSC) of known genetic background with the variant and wildtype homozygous alleles of PNPLA3. These iPSCs grow well in culture and readily differentiate to hepatocyte-like cells (HLCs). To test the hypothesis that the variant PNPLA3 allele confer its risk due to aberrant lipid metabolism resulting in lipotoxicity in the early onset of NAFLD, we compared intracellular lipid accumulation by Nile Red triglyceride staining. We found that PNPLA3 variant HLCs accumulate lipid droplets at baseline and upon exposure to palmitic acid (PA), a toxic fatty acid that is prevalent in diets rich in saturated fats. PNPLA3 expression is reduced in variant HLCs, which is compensated by increased expression of other genes involved in lipolysis, such as PNPLA2 and PPARa. Variant HLCs also upregulate autophagy, which may be a consequence of lipid accumulation as autophagy has been proposed as a mechanism of lipid turnover in hepatic cells. To further explore the link between lipid accumulation and inflammation, we measured gene expression and secretion of cytokines that are relevant to the development of inflammation in NAFLD. We found that PNPLA3 variant HLCs have increased expression of IL1b at baseline, and increased secretion of IL1a and IL6 upon PA treatment. In summary, we have generated and validated the first known human model carrying polymorphisms specific to the PNPLA3 locus to study mechanisms of NAFLD. We have evidence that the variant allele of PNPLA3 contributes to aberrant lipid processing that may be the initiating even in NAFLD. We are currently testing compounds that ameliorate lipid accumulation and inflammatory phenotypes in variant HLCs with a focus on PPAR alpha agonists and autophagy inducers.

274 10:45 am

Cryopreservation Of Encapsulated Stem Cell Derived Pancreatic Beta-Cell Progenitors for the Treatment Of Diabetes

Julio Valle, Biology (U)

Worldwide there are close to 382 million people suffering from diabetes. All patients with Type 1 diabetes and 25% of patients with Type 2 diabetes are treated with exogenous insulin. However, insulin injections lack the minute-to-minute precision islets provide and can lead to debilitating complications. Islet transplantation, an alternative treatment approach, has been limited by a shortage of donor organ tissue and the need for lifelong immunosuppression. Human embryonic stem cells (hESCs) are considered a potential solution to the problem of supply and encapsulation inside a robust retrievable device (Theracyte) could mitigate the need for immunosuppression. Our lab has previously demonstrated that encapsulated human embryonic stem cell derived islet progenitor (hESC-IP) cells mature and acquire glucose responsiveness following transplantation, curing diabetes in mice. The encapsulation devices were immunoprotective, prevented cell escape, and could be transplanted subcutaneously. The ability to cryopreserve hESC-IPs pre-loaded into devices could enhance quality control, consistency and dissemination of the therapy to clinical trial sites and eventually to treatment centers. Unfortunately, traditional slow freezing approaches have not worked well for cells inside durable devices. We hypothesized that this was due to formation of ice crystals that damage cells during slow freezing. To overcome this, our lab has focused on an alternative freezing approach called vitrification in which cells are frozen at high speed to achieve a glass state and avoid glass crystals. We have identified vitrificant solutions that are tolerated by hESC-IPs and engineered specialized technology for hyperfast cooling of encapsulated cells in liquid nitrogen. In a proof of principle study, we have tested the hyperfast cooling device, successfully vitrifying encapsulated cells that were thawed three weeks later. The cryopreservation of hESC-IPs inside immunoprotective devices could speed the development and ultimate use of encapsulated stem cell treatments for diabetes. Moreover, the technology is amenable to use with other encapsulated stem cell derived treatments.

Session B16

Poster Presentation: Engineering & Computer Science P3 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

275 10:45 am

The Effect of Inflow Cannula Length on the Intraventricular Flow Field of the Evaheart LVAD-assisted Heart

Josue Campos, Mechanical Engineering/Bioengineering (U)

Left Ventricular Assist Device (LVAD) inflow cannula malposition is a significant risk for pump thrombosis. Thrombus development is influenced by altered flow dynamics, such as stasis or high shear that promote coagulation. The goal of this study was to measure the intraventricular flow field surrounding the apical inflow cannula of the Evaheart centrifugal LVAD, and assess flow stasis, vortex structures and pulsatility for a range of cannula insertion depths and support conditions. Experimental studies were performed using a mock loop with a customized silicone left ventricle (LV) and the Evaheart LVAD. A transparent inflow cannula was positioned at 1cm, 2cm, or 3cm insertion depth into the LV and the velocity field in the LV midplane was measured for two levels of LVAD support: 1800rpm and 2300rpm. The LV velocity field exhibits a diastolic vortex ring whose size, path and strength are affected by the flow conditions and cannula position. During diastole, the large clockwise midplane vortex grows, but its circulation and kinetic energy are reduced with cannula insertion depth. The counter-clockwise vortex is smaller and exhibits more complex behavior, reflecting a flow split at 3cm. Overall, the 1cm cannula insertion depth produces the flow pattern that exhibits the least apical flow stasis and greatest pulsatility and should correlate to a lower risk of thrombus formation.

276 10:45 am

The Importance of Calcium Influx in Regards to Actin-Myosin Force Propagation

Brianna Manns, Mechanical Engineering (U)

The regulatory mechanisms of muscle movement, driven by actin-myosin contractile forces, can provide important insights for the design of biomimetic active matter systems. With this goal in mind, we study the various strategies employed in the muscle to control motor protein activity and their transitions between active and inactive states. For example, the activation of motor protein binding sites on actin filaments is regulated by the intracellular calcium concentration. Similarly, the motor stepping rates and transition times between active an inactive states can be regulated by the ATP concentration as well as a force feedback across the various motors. Finally, the spatial structure of the filaments and the motor proteins also affects the overall muscle performance. In this project, we have built a detailed computational model of the motor-protein myosin and actin interactions for a many-motor muscle-like system. We use this model to answer the questions described above. Our results have shown that the spatial placement of motors with respect to actin binding sites can significantly influence the power output of the system. The model also predicts that a strong coupling between the motors allows for a force feedback mechanism that is important to overcome motor function defects such as motors with with defective motors with low ATP hydrolysis rates. We are also able to predict the optimum calcium influx and sequestration cycles for specific force and work outputs from the actin-myosin system.

277 10:45 am

Motion and Respiration Rate Detection Using PIR Sensors

Anna Reed, Computer Engineering (U)

The domain of my research pertains to working on a method to continuously monitor a patients' motion and breathing patterns. This will eventually contribute to help those affected by asthma or Alzheimer Disease receive better treatment and understanding of any issues. This is achieved by utilizing four ambient PIR, or passive infrared, sensors that continually record data within its range. These PIR sensors are distinctly different than other methods that monitor respiration rate and motion because it is a hands-off, continuous way of monitoring respiration rate and periodic motions.

In the PSOC environment, the four PIR sensors obtain analog signals from its surrounding environment. The four PIR sensors are fed through a multiplexer that continuously cycle through the four channels to get data from each PIR sensor. The multiplexer leads to an ADC converter and the output is transmitted through USBUART and the results are displayed on a graph on the computer screen after using Matlab to open up the port and display the data.

In this project, I was able to collect data from my own respiration rate and motion. I placed the sensor about 3 feet in front of me and recorded data as I was sitting down and breathing at resting rate and after brief exercise, as well as repetitive motions such as sitting down and standing up. I observed the periodic signals, that would help the analyzer notice when a patient is repeating movements or breathing normally.

Although this summer I collected data, I have not started analyzing the results. I noticed similar patterns and periodic movements. Overall, this is a start to the main goal of being able to implement this device on the ceilings of multi-tenant facilities to monitor respiration rates and motions.

278 10:45 am

The interaction of LV geometry, function, inflow cannula diameter, and LVAD support and its effect on the intraventricular flow field Saniya Salim, Bioengineering (M)

Left ventricular assist devices (LVADs) are mechanical pumps that are surgically attached to the left ventricle apex and aorta. Clinical studies show that LVADs improve patient health and quality of life, and dramatically reduce the mortality of cardiac failure. During periods of high LVAD support and decreased pulsatility, suction of the left ventricle (LV) into the inflow cannula can occur, disrupting pump function and injuring the myocardium tissue. Our hypothesis is that the diameter of the LVAD inflow cannula must be matched to the volume/size of the LV in order to mitigate suction and produce optimal flow dynamics through the LV-LVAD system. The goal of this study was to measure the flow through a transparent model of the LVAD-supported LV, varying the inflow cannula diameter size and employing the speed range of the HeartMate II LVAD (Thoratec, Inc) which is the most widely implanted LVAD.

Experimental studies were performed using a mock circulatory loop with a customized silicone LV and porcine bioprosthetic heart valves to simulate the biomechanics of the human heart. Particle image velocimetry (PIV) measurements of the long axis midplane of two LV models (100 ml, 180 ml volume) were performed for a range of LVAD support conditions and three inflow cannula diameters (12 mm, 16 mm, 20 mm). A constant ejection fraction of 25% was maintained. Vortex dynamics. pulsatility, and transport indices were calculated from the image data. Results for the 16 mm cannula diameter show that the direct flow, DF (fraction of particles leaving the LV during the first cardiac cycle), increases 60% with LV volume. Delayed ejection flow (DEF) during the second cardiac cycle was similar, but Residual Flow, RF (fraction of particles remaining after 2 cardiac cycles) decreased 50% from the 100 ml LV to the 180 ml LV. While the 180 mL LV sustained high LVAD support and showed a decrease in pulsatility, suction did not occur. Analysis of studies for the remaining cannula diameters is underway and will provide insight into the importance of matching cannula diameter to the LVAD recipient.

279 10:45 am

The Effect of Reverse Remodeling on Intraventricular Flow in the LVAD-Supported Heart Studied in a Mock Circulatory Loop

Ricardo Montes, Bioengineering/ Biomechanics (M)

Heart failure is identified by many features to treat patients appropriately. Among these features are cardiac geometry, measured by changes in the size and shape of the left ventricle (LV), and myocardial function, indexed by ejection fraction (EF). Implantation of mechanical circulatory support immediately boosts systemic blood flow, and is often followed by reverse remodeling (RR) of the heart, which includes a reduction in LV volume (LVV) and an increase in EF. A better understanding of the response may yield insights into the adaptive treatment needed to coax the heart to recover. The goal of this study was to measure the effect of EF and LVV on the LV flow dynamics of the LVAD-supported heart.

Three LV models with volumes of 180, 150, and 100 ml, are studied separately in a mock circulatory loop and connected to a Thoratec Heartmate II LVAD. Measurements of 2-D velocity in the midplane of a model left ventricle (LV) were made for several cardiac conditions using a cardiac simulator generating LV flow patterns resembling those from patients. Velocity fields were measured using Particle Image Velocimetry (PIV). Vortex structures were analyzed by calculating the vorticity from the measured velocity, and using the Q criterion to identify the vortex boundaries. Circulation and kinetic energy (KE) were computed, as well as vortex size, shape and position during the cardiac cycle. The baseline condition corresponds to a mean aortic pressure of 65 mmHg and a cardiac output of 3.5 L/min, combined with an LV volume of 180 mL to produce an ejection fraction of ~25%, representative of a dilated cardiomyopathy patient with a heart failure.

The addition of LVAD support at 11 krpm produced an increase in systemic flow and pressure to approximately 5.7 L/min and 100 mmHg, respectively. Vortex KE increased slightly, as observed in our previous studies. The changes in LV flow that accompanied LVV reduction during LVAD support at 11krpm indicated that some indices of transport are worsened. Additional studies investigating the effect of EF will clarify the contributions of these two features of RR and perhaps improve insight into myocardial recovery.

280 10:45 am

Left Ventricular Thromboembolic Risk in the LVAD-Assisted Heart

Vi Vu, Mechanical and Aerospace Engineering (D)

Congestive heart failure (HF), which affects approximately 5.7 million Americans, is the condition when the heart cannot sufficiently pump enough blood to other tissues and organs [Circulation, 2015]. Left ventricular assist device (LVAD) implantation is an optimal treatment when comparing to heart transplant in term of availability and patient outcomes. LVAD is a mechanical pump, that is surgically attached to the left ventricle (LV) and aorta and takes over some of the heart's workload.

LVAD implantation alters intra-ventricular blood flow which creates a stasis region along the left ventricular outflow tract (LVOT). In the presence of blood-contacting device, stasis flow has been linked to thrombosis (abnormal blood clot). This was observed in post-LVAD implanted patients as reported in 2013 ASAIO case study about a recurring thrombus along the LVOT. The recurrence occurs as the result of disturbed blood flow and lack of pulsatilily [May-Newman et al. 2013). To investigate the flow field deviation in the presence of LVOT thrombus, the SDSU bioengineering lab's cardiac simulator, which can simulate various LV intra-ventricular flows, was used as the experimental model. The flow field was obtained using Eulerian approach, and to investigate the overall effect on the LV flow pattern along with the local effect at the surrounding regions near the thrombus [Reider et al. 2015]. Further analysis is carried out by applying Lagrangian Coherent Structure in order to identify major flow structures as well as the regions of high shear stress [May-Newman et al. 2016].

The results obtaining from Eulerian and Lagrangian are in agreement with one another. At the presence of the small LVOT thrombus (~7mm), the overall LV vortical flow pattern does not change. At the thrombus site, as LVAD support increases, the regional distal velocity near the aortic valve (AoV) is decreased thus increased the ratio of regional distal to proximal velocity. This introduces a larger stasis region underneath AoV and higher shear stress at the thrombus site. Together, they induce platelet activation and promote thromboembolism; thus implying further growth of the existing thrombus.

Session B17

Poster Presentation: Behavioral & Social Sciences P5 Friday, March 3, 2017, 10:45 am Location: Montezuma Hall

281 10:45 am

African American relationships and Hip Hop Kendra Boardingham, Psychology/TFM (U)

There has been a major decline in the amount of marriages in the last twenty years, especially in the black community. Researchers have suggested many reasons, but one large reason is the music of the African American community. Researchers have suggested that music can influence the status of relationships within the black community. Due to the sexualized and demeaning language in majority of hip hop songs, research suggests it correlates with the decline in marriages. It is hypothesized that African American people who listen to majority of hip hop music are less likely to be in committed relationships. Research was conducted and many articles were analyzed to support the hypothesis. An additional survey was also assigned to twenty African American men and women to assess their feelings about relationships. All those who were surveyed were between ages 18-25, and all listened to majority hip hop music. In conclusion, researchers were able to find that there is an overall shift in the desire of relationships and value of women. Not only do some report not wanting to be committed, some agree that music directly effects their relationship status.

282 10:45 am

Crystalized Cognition in Children with Heavy Prenatal Alcohol Exposure Rebecca Carvalho, Psychology (U)

Prenatal alcohol exposure can impact neurodevelopment. As a result, children with heavy prenatal alcohol exposure often have cognitive and behavioral impairment. This study evaluated measures of crystalized cognition, specifically reading and vocabulary skills, using the NIH Toolbox. We hypothesized that children with histories of heavy prenatal alcohol exposure would perform poorer on these cognitive tasks as compared to controls. Subjects were children ages 8.0-16.9 (M=12.6, SD=3.0) with heavy prenatal alcohol exposure (AE, n=12) and without such exposure (CON, n=12). The NIH Toolbox Oral Reading Recognition and the Picture Vocabulary tests were administered to all children. Group differences in the age-adjusted scaled scores were analyzed with Multivariate Analysis of Variance (MANOVA). Results showed significant a group difference in crystallized cognition [F(2,21)=16.5, p<.001]. The AE group had significantly lower age-adjusted scores on both the Oral Reading Recognition [F(1,22)=25.1, p<.001) and the Picture Vocabulary [F(1,22)=19.9, p<.001) tests. This investigation extends previous research to show that children with histories of heavy prenatal alcohol exposure perform poorer on measures of receptive vocabulary and reading skills. This suggests that children with fetal alcohol spectrum disorders would benefit from interventions targeted at improving language skills.

283 10:45 am

Effects of Moderate Ethanol Consumption on Gene Expression Involved in Lipid Metabolism and Inflammation in Rats

Jeremy Pascua, Psychology (U)

Prior epidemiological studies and experimental data from rodent models have reported a nonlinear relationship between consumption of alcohol and cardiovascular disease (CVD) risk that suggests light-to-moderate drinking as opposed to excessive consumption may provide some cardiovascular benefits. The present study examined potential mechanisms by which moderate alcohol consumption may provide a protective effect against cardiovascular disease. Twenty-four nondeprived adult Wistar rats (n=12/group) were allowed to voluntarily consume a 20% v/v ethanol solution on alternate days for 13 weeks (45 ethanol drinking sessions total) or were given access only to water (non ethanol-exposed control). The intermittent access 20% ethanol drinking paradigm utilized results in mean blood alcohol levels of ~30-50 mg/dl in the outbred Wistar strain when measured 30-120 min into a standard drinking session (Cippitelli et al., 2012; George et al., 2012; Simms et al., 2008), Following the final experimental session, tissues were collected for subsequent analysis. There was no difference in body weight gain over time between

ethanol-exposed and control rats, however epididymal fat weight at the end of the study was lower in ethanol-treated rats (P=0.030). Blood glucose (P=0.030), total cholesterol (P=0.036) and LDL-cholesterol levels (P=0.031) were also lower in the ethanol group compared to control. There was a significant reduction in the expression of hydroxymethylglutaryl-coenzyme A reductase (Hmgcr) and sterol regulatory element-binding protein-2 (Srebp-2) in ethanol-treated rats (P=0.026 and P=0.034, respectively), suggesting that ethanol may have lowered cholesterol levels via downregulation of genes involved in cholesterol synthesis. Paraoxonase-1 (Pon-1), which is associated with inhibition of LDL-cholesterol oxidation, was upregulated in the ethanol group (P=0.029). Cyclooxygenase-2 (Cox-2) and nuclear factor NF-kappa-B p65 subunit (Rela) gene expression were significantly decreased in ethanol-treated rats (P=0.016 and P=0.047, respectively), indicating possible anti-inflammatory effects. These findings suggest that moderate ethanol consumption may potentially contribute to improved cardiovascular outcomes by reducing body fat, improving blood cholesterol and blood glucose, and modulation of gene expression involved in inflammation.

284 10:45 am Benefit Finding Exam

Benefit Finding Examined in Various Pediatric Craniofacial Deformities

Michelle Faulkner, Psychology (U)

Craniofacial deformities are a variety of conditions that exhibit an irregularity in the growth of the head and facial region. The conditions present in this study are grouped into 6 conditions cleft lip/palate, craniosynostosis, craniofacial microsomia, microtia, a dermatological/vascular condition (a condition that is dermatological or vascular in nature and can include Giant Hairy Nevi, Port-wine Stains, or hemangiomas of the face), and other (this includes acquired conditions such as burns or trauma and conditions that do not fit into any of the other five conditions). These conditions affect many children around the world and their quality of life. Research has examined a behavior labeled benefit finding in many other chronic illnesses and deformities in adults and children. However, very little research has been done on children and no research in benefit finding in children with craniofacial deformities. Therefore, this study will expand on previous literature to examine benefit finding in children with craniofacial deformities and what domains they encompass. The present study recruited children from Rady Children's Hospital Surgery Clinic and the Fresh Start Clinic. Researchers then performed in-depth interviews with 47 children. These interviews are a subset of interviews from a larger study with 127 participants, which also includes the parents of the children. The interviews were then transcribed and any non-English transcripts were translated to English. The children transcripts are to be coded for any mention of benefit finding based on a researched definition. The coding will then be analyzed to examine what domains were portrayed and a discussion on those domains will follow.

285 10:45 am

The Effects of Age and Comorbidity on the Likelihood of Hiring a Health Care Advocate Among Traumatic Brain Injury Patients Lauren McKinley, Psychology (U)

Approximately 1.7 million people experience a traumatic brain injury (TBI) in the United States each year and about 53,000 will die from TBI-related causes. The treatment options for a TBI vary depending on severity. Patients often have complex and continuous treatment plans, especially those who are older and have a comorbid health condition. A health care advocate (HCA) is a trained professional who can help ensure patients optimize their treatment outcomes by providing advisory and supportive services that simplify the navigation of the health care system. The present study was conducted to determine whether age and comorbidity (type 2 diabetes) predicted the perceived likelihood of hiring an HCA for those with a TBI. It was hypothesized that being older and having a comorbid health condition would predict a greater perceived likelihood of hiring an HCA. Participants were 470 randomly selected community members, asked to complete a self-report questionnaire. A two (comorbidity) by three (age) between subject's analysis of variance was performed on the mean perceived likelihood of hiring an HCA for those who had a traumatic brain injury. A significant main effect was found for vignette age, F(2, 464) = 4.307, p = 0.014. A post-hoc Gabrielle's test revealed that the perceived likelihood of hiring an HCA was greater for 90-years old than 30-years old (p = 0.017) but not 60-years old. No significant differences were detected between 30-years old and 60-years old. Comorbidity did not significantly predict the perceived likelihood of hiring an HCA. The results indicate that older individuals who have sustained a TBI report a greater perceived likelihood of hiring an HCA than do younger individuals who have sustained a TBI. These findings may help various health care advocacy organizations identify the specific populations most interested in using their services. Additional research is necessary to determine the ways in which HCAs are able to help individuals who have sustained TBIs receive optimal care and improve their overall wellbeing.

286 10:45 am

Parental Dialogue on Sexual Health Topics: Implications on Sexual Risk Behaviors for STI and Unintended Pregnancy among Adolescent Girls at the US-Mexico Border

Marissa Salazaar, Global Health (D)

Statement of Problem: While most parents find it uncomfortable to talk to their children about sexual health, communication between parents and children regarding these issues has shown to be protective against adolescents' risky sexual behaviors. For families near the US-Mexico border, where rates of STI and unintended pregnancy are high among girls, barriers related to the separation of families across the border as well as cultural norms prohibitive of open discussion may further limit parental dialogue on sexual health. However, little is known about parental communication on sexual health and girls' primary sources of health information among adolescent girls at the border region.

Methods: In-depth interviews (n=23) were conducted with sexually active girls aged 15-19 recruited from a SD County health clinic near the US-Mexico border. Interview questions focused on identifying risk factors for STI and unintended pregnancy. Interviews were analyzed to determine common themes related to girls' sources of sexual health information and the factors associated with sexual health communication between parents and girls.

Essential Outcomes: Most participants reported lack of parental dialogue on sexual health and cited parental discomfort as the primary reason for the lack of communication. Girls often reported that parents would voice disapproval over early pregnancy but not provide any information on how girls could protect themselves against unintended pregnancy. Friends and other family members were the primary sources of sexual health information, but this information was also often incomplete or inaccurate. Girls reported receiving inadequate information at school as well. Altogether, the information girls received did not detail where and how to get contraceptives, how different forms of contraception worked, what they protected against, and did not consider other social and relationship factors (e.g. male partner's contraceptive use.

Conclusions: Our findings suggest that parental dialogue on sexual health is largely absent in this population and that girls are not receiving accurate or sufficient sexual health information from other sources. Improved sexual health communication is needed to ensure that girls can make informed sexual decisions, and ultimately, to prevent STIs and unplanned adolescent pregnancies in this region.



Abstracts of Presentations

Session C



Session C-1

Oral Presentation: Behavioral & Social Sciences OR5 **Friday, March 3, 2017, 1:00 pm** Location: Pride Suite

287 1:00 pm

Exploring Immigrant and Refugee Women's Perceptions of Feminism, Women's Roles in Society, and Gender-Based Obstacles Marisa Meno, Social Science (U)

San Diego County is one of the largest refugee resettlement areas in California as well as a prominent destination for immigrants from across the globe. Because many of these immigrants and refugees are women, the feminist community must learn about the unique experiences and obstacles of these women in order to be culturally sensitive to their needs. Towards this end, this project assesses immigrant and refugee women's perceptions of feminism and women's roles in society, while also identifying obstacles they have faced in San Diego. Data were collected through workshops at Nile Sisters Development Initiative (NSDI), a nonprofit in San Diego that works with immigrants and refugees. Each workshop included a lecture and discussion about feminism and problems women face in society. Pre and post surveys were distributed during the workshops in order to measure participants' attitudes about feminism and women's roles in society. Participants included 10 females and 1 male; all were immigrants or refugees. In addition to the workshops at NSDI, a condensed version of the workshop was presented to 30 Burmese immigrants and refugees at the Karen Organization's Women's Empowerment Summit. I also interviewed three community leaders that work closely with the female immigrant and refugee community in San Diego to gain further insight into the obstacles the community faces. This project found that most immigrant and refugee women were not aware of feminism before coming to the workshop. After the workshop, there was an increase in awareness of what feminism is and participants were more likely to identify as feminists. Most participants believed that women should have more expansive roles outside of the home and did not agree with the enforcement of gender roles. However, according to these surveys, these attitudes did slightly alter after the presentation with some actually demonstrating more conservative views of gender roles. The most commonly cited problems that immigrant and refugee women faced were: employment, lack of education, the expectations they must take care of their children, and language barriers.

288 1:15 pm

Examining overlap among various forms of interpersonal violence: Results from the SDSU Sexual Violence Campus Climate Survey Wendy Avila, Psychology (U)

Sexual assault is a significant challenge for colleges and universities nationwide, affecting the health, mental health, and academic success of students. Many schools are working to address sexual assault, but lack assessment tools to understand the nature of the problem. Institutions of higher education are looking to climate surveys to fill this gap in knowledge, and conducting regular climate surveys is a best-practice response to campus sexual assault. Although knowing more about sexual assault, relationship violence, and stalking, are on their own worthy of research, evidence reveals that these are high interrelated and victims of one form of violence are likely to be victims of another. Thus understanding more about the overlap among victimization can provide more insight into how victimization exists in the real world. The current study will describe the rates of reported sexual assault, relationship violence, and stalking among students, as well as explore the percentage of overlap among respondents who have experienced multiple forms of victimization. We will also generate profiles for each of the various categories of victimization and overlapping victimization to examine possible implications. The proposed study is part of a larger campus survey, which identified sexual violence prevalence rates and related factors. Following recommendations from The White House Task Force to Protect Students from Sexual Assault (2014) SDSU created an anonymous survey which includes questions about sexual assault/violence on or near campus, attitudes about sexually related violence, inclination to intervene/help in response to sexual violence, and awareness of sexual violence related services and policies. All students were contacted via their university provided email and given a link to the anonymous survey (created using Qualtrics). They had the option to complete the survey online in a private place/ computer, or opt out of the study. Data from this survey were analyzed using SPSS to run statistics and create profiles for the current study. Preliminary results indicate that 17% of survey respondents experienced sexual assault, 16% experienced relationship violence, 4% experienced stalking, and nearly 7% of respondents reported more than one form of victimization. Additional descriptive analyzes and victim profiles will be explored.

289 1:30 pm

Domestic Violence Against Women as it Relates to Human Rights Elvina Rofael, Political Science (U)

How does domestic violence against women relate to human rights, and what role do 'gender-neutral law" and "gender-biased application" play, if any? This thesis will observe domestic violence cases across the globe and will take a look at how each respective government responds to these cases from all levels-are government heads implementing human rights laws in relation to domestic violence against women? Are judges and lawyers citing conventions based around human rights laws during litigation? Furthermore, this paper will explore possible resolutions to the issue of domestic violence against women (VAW). How can men be better involved to act against VAW? What policies or practices can lead to a greater understanding among the younger generation to view VAW as unacceptable.

290 1:45 pm

The Dangling Conversation Matthew Baukol, History (M)

For female writers in colonial America, common correspondence became an outlet through which women could express less traditional topics of conversation. The limitations of the primarily domestic lifestyle custom to women in the eighteenth century resulted in the desire to expand beyond the household and converse with like-minded women. The women were able to increase their agency by saving and collecting the correspondence. Significant letters would be copied into a commonplace book or manuscript that would be spread through the network of women. The construction of these social networks allowed women the opportunity to solidify their cultural significance as well as discuss growing political concerns. The established networks would allow materials to be circulated among women, transcribed, and passed to additional friends and family members. The friends and family would then annotate, take notes, or write comments to reply and express either agreement or a dissenting opinion.

For the women who participated in these networks of correspondence, their letters were the way for them to contribute to the growing questions and concerns attributed to the social and political surroundings. This paper will address the participation of Annis Boudinot Stockton, and Hannah Griffitts. I decided to focus on these two female writers due to their progression and evolution of literary style throughout their careers. While their origins are similar, their literary styles display the different circumstances that guided their lives. Through careful examination of their writings, I will discuss the complicated changing identities for these women in the decade of the American Revolution. These authors used their writing to engage in the cultural issues the only way the patriarchal structure allowed. The correspondence they participated in provided an exit from the domestic sphere and an entrance into the public sphere. The women were aware of the cultural restrictions and recognized their writings as a challenge to the rules established by their society. The letters demonstrate their frustrations attributed to the limitations of their sex and provide insight to the unique style of feminism that was established in the eighteenth century colonies.

291 2:00 pm

Recounting, Resisting, and Reconfiguring: Transforming Women's Marginality Into Agency Through Art

Jason Crane, Communication (M)

The historical marginalization and discrimination of women in society defies a simple explanation, and yet, its persistent effects require women to continuously make sense of, navigate, and find explanations for it. By communicating the experience of marginalization through art, music, and performance, female artists enact micro-interventions within the social relationships and institutions that structure the experience of marginalization, thus becoming authors of their own visibility and subsequent emancipation from the margins of society.

This study analyzes the narratives of female artists who incorporate their experience of marginalization as the subject of their art, and how that process affects their relationship to the experience of marginality. The narratives I analyzed revealed a number of ways in which marginality is experienced and defined by women, as well as a diversity of strategies offered by the creative process to confront it.

I found that art played an important epistemological role for women, enabling them to both name and know their experiences to be true, while simultaneously contributing to larger discourses of awareness, resistance, and the development of conscious communities through symbolic and alternative avenues of communication. Art, music, and performance, are therefore framed as mediums through which social injustices may be communicated and leveraged into social change.

In order to understand how this process works, I build on Karl Weick's (1995) theory of "sensemaking," which describes the process of retrospectively making sense of events in anticipation of future efforts to understand, organize, and take action. I extend Weick's theory by introducing the concept of "sensorymaking," which describes the process by which artists, as manipulators of the environment and agents of symbolic meaning making, precede and precipitate the process of "sensemaking" in the minds of those who encounter the altered environments and artifacts. This exchange between our sensing and making-sense-of possesses a profound capacity to raise awareness, provoke dialogue, and activate a cascade of dialectical transformations between self and society.

Session C-2

Oral Presentation: Education OR2 Friday, March 3, 2017, 1:00 pm Location: Park Boulevard

292 1:00 pm

Transforming the Curriculum: Impact of High School Ethnic and Women's Studies Classes on Chicana/Latina Students Celeste Rossbach, Social Science Single Subject and

Women's Studies (double major) (U)

The purpose of this study is to analyze the impact of how Ethnic and Women's Studies courses being taught at the high school level would have an impact on young students of color, specifically girls, through its implementation in state curriculum and standards. The goal is to show the interrelationship between Ethnic and Women's Studies classes being offered in high school that teach about culture, erased history, self-love, empowerment, oppression and resistance from an engaged pedagogical approach that emphasizes the "whole" self, or "bodymindspirit," is connected to Chicana/Latinas pursuing a higher education in both community colleges and universities, thus having a positive impact. The methods used in this research will stem from a Chicana feminist methodology to conduct ethnographic research that centers the experiences of both activist educators and students through participant observation and face-to-face interviewing. Previous research shows taking Ethnic and/or Women's Studies courses in high school leads to students attending class more often, staying in school and graduating, and a higher amount of Chicanas and Latinas pursuing higher education. These studies also challenge the argument that such courses are unnecessary or are "un-American" and should only be taught on college campuses. A review of the literature suggests that incorporating Ethnic Studies and Women's Studies into high school students of color's curriculum makes a positive impact on the involvement, participation, and continuation of Chicana/Latinas in higher education, and their successes both inside and outside of the classroom.

293 1:15 pm

Examining the Influence of Environmental Challenges on the Success of Men of Color in Community College

Anthony Mota, Communication (U)

The purpose of this study is to examine environmental challenges men of color face in community college as it relates to student success (e.g., transfer, achievement, persistence). Environmental challenges for this study refers to students experiencing food instability, unstable living conditions, and transportation challenges. These challenges are essential needs and critical to the academic success for men of color.

This study used a qualitative methodology. Data collection was captured through focus group sessions at four community colleges in the Western region of the United States. Participants were students who identified as "men of color" (e.g., Latino, African American, Southeast Asian, Native American) and were currently enrolled in one of the four community colleges. There were a total of 121 participants who were recruited through the community college. More specifically, majority of the participants were recruited through support programs at the community college. The data analysis for this study was completed using a three-phase coding process proposed by Charmaz (2006) which consists of initial, focus, and theoretical coding. Various methods were also used to ensure the credibility and trustworthiness of the findings. Constant comparison of data, along written memos were also included to strengthen the reliability of data. Findings from data analysis provided a better understanding of environmental challenges men of color face in community college. Three thematic themes emerged from the data analysis: (1) food instability, (2) unstable living conditions, and (3) challenges with transportation.

Implications for future research should focus on further examination of the effects of food, housing, and transportation instabilities for students in the community college sector on student success due to the lack of literature on environmental challenges, specifically in community college sector. In addition, implications for future practice should be concentrated on creating on-campus resources and programs for students experience challenges with food, housing, and transportation insecurities.

294 1:30 pm

Men of Color in the Community College and their Perceptions of Faculty Welcoming Their Engagement

Alejandro Arias, Foods & Nutrition (U)

Statement of the Problem: Community college serve as the primary pathway into postsecondary education for males of color (e.g., Black, Latino, Southeast Asian). However, research found that males of color are less likely to complete their educational goals (e.g. certificate, degree, transfer) than their White male counterparts (Wood, Harris, Xiong, 2014). Moreover, while research has shown that faculty student engagement plays a key role in the success of men of color (Bauer, 2014; Harris & Wood, 2013), most men of color are less likely to engage because they don't feel welcome to engage with their faculty (Bush & Bush, 2010; Wood, 2014). Given this, this study examined men of color in community colleges and their perceptions of faculty welcoming their engagement inside and outside of class.

Methods: This study employed data from the Community College Survey of Men (CCSM) and included a sample of 941 participants from nine southern California community colleges who self-identified as Black, Southeast Asian, or Latino. Multiple linear regression was used to predict men of color's perceptions of faculty welcoming their engagement inside and outside of the classroom (Dependent Variables) with the following independent variables: background/defining, environmental, campus ethos, academic, and non-cognitive.

Results & Conclusion: Results indicated that campus ethos variables were significant predictors of men of color's perception that faculty welcome their engagement both inside and outside the classroom. Background/defining and environmental variables were also significant predictors. Findings from this study have implications for how community college faculty can better support the success of male students of color in community colleges.

295 1:45 pm

Opening Communication and Bridging Knowledge: Increasing Involvement of Parents of Latino High School Students Angela Cerda, School Psychology (M)

Oceanside High School in Oceanside, California is a large high school of over 2000 students. While cohort dropout rates are generally decreasing at OHS, OHS still has a dropout rate higher than the district average. Furthermore, the majority of students who drop out are Latino, English language learners and/or socioeconomically disadvantaged. Over 60% of the student body is Hispanic or Latino, with 57% speaking Spanish as a first language. Spanish-speaking students and parents sometimes experience a disconnect with school staff, who are overwhelmingly white and English-speaking. Teachers often have lower expectations of Latino students. As a result, Hispanic or Latino students are often underrepresented in Advanced Placement classes and improperly steered away from college preparation tracks. Establishing positive, collaborative relationships between home and school is instrumental to student success and has measurable effects on student grades, student attitudes toward school and the students' post-high school options. Research has shown as parents become more involved in a child's academics. positive outcomes for the child increase. We conducted a family-school collaboration intervention in which we delivered a Spanish-language presentation on A-G requirements and college options to a group of Spanish-Speaking parents.

We began by conducting a needs assessment of the Latino English learner community, connecting with the parents directly through the English Language Advisory Committee (ELAC). We coordinated with the Community Liaison and distributed surveys to parents involved in ELAC in order to gather information regarding parental concerns and areas of need. Our inquiry demonstrated that parents were unsure what A-G graduation requirements were and had little information regarding post-secondary education. We conducted a parent workshop with the ELAC community to increase parental understanding and awareness of their student's lives at OHS. A post workshop questionnaire demonstrated positive results, with parents indicating increased self-efficacy and awareness of school policy.

296 2:00 pm

The Community College Experience of Southeast Asian Men from Community College to a Four-year University Melissa Vang, Education (D)

Research on men of color in community college has been a growing interest in the past years. However, research focused on Southeast Asian (SEA) men within the two-year sector is limited. With the limited research on SEAs, Maramba (2011) speculate that SEA students are more likely to attend community college and less likely to earn a degree. In addition, SEAs have the lowest educational attainment rates and the highest poverty rates compared to their Asian peers. Given this, the purpose of this exploratory study is to examine factors that contribute to the success of Southeast Asian (e.g., Vietnamese, Hmong, Laotian, Cambodian) men who began at a community college and transferred to a four-year institution. This exploratory study is a part of a larger study of narratives from men of color (e.g., African American, Latino). Purposeful and snowball sampling were utilized for recruitment. All interested participants were contacted through email and provided with the purpose of the study and the research prompt. A total of five SEA men participated in the study. More specifically, majority of participants who submitted a narrative were Vietnamese and Hmong. Data were analyzed using initial, focused, and theoretical coding (Charmaz, 2006). Three overarching themes emerged from the analysis: (1) academic barriers, (2) environmental challenges, and (3) peers, partners, and parents. This study is imperative to the literature on men of color, specifically SEA, highlighting the experiences of students in community college and identifying barriers and factors that affect their academic success. Implication for future research should focus on SEA students in post-secondary education to provide a better understanding of their educational needs. Implication for practice should include services and programs that understand the unique historical background of SEA groups and are tailored to specific needs of SEA students in fostering their academic potential.

297 2:15 pm

Worn Out: The effects of External Life Events on outcomes of success in the Community College Nexi Delgado, Educations (D)

The purpose of the study was to understand the effects of stressful life events on outcomes of student success (college GPA, persistence, on track for goals) for students in the community college while controlling for age, income, dependents, high school grade point average, and time status. Data was collected through the Community College Success Measure (CCSM). The findings were non-significant for the outcomes of college GPA and persistence, but significant for on track for goals. Although external life events may deter a student from being on track for their goals, this is not a deterrent for a student's persistence or ability to achieve high grades. Future research would look at factors that ease the effects of stress.

Session C-3

Oral Presentation: Biological & Agricultural Sciences OR4 Friday, March 3, 2017, 1:00 pm Location: Tehuanco

298 1:00 pm

Pacing and α_1 -Adrenergic Stimulation of Rat Ventricular Cardiomyocytes and Mouse Cardiac Stem Cell Viability.

Andy Fedoriouk, Chemistry/Biochemistry (U)

Heart disease is an intricate and pervasive health problem that inflicts massive costs upon the U.S. healthcare infrastructure but lacks a definitive cure. Major impediments to the development of a cure include, the increasingly complicated signal transduction, local and inter-system endocrine communication and genetic aberrations present among the different cell types in the heart. Specifically regarding the research branch of inter-cellular communication, a new field of study centered on cardiomyokines or secreted factors from heart tissue is emerging. With the consideration of the relevance of secretion from heart cells a conditioned media paradigm is used in this study which involves examining the impacts of culturing mouse cardiac stem cells (CSCs) in media previously used for treatment culture of neonatal rat ventricular myocytes (NRVMs). We hypothesized that chronic electrical stimulation and treatment of neonatal rat ventricular myocytes (NRVMs) with α_{1} -adrenergic agonists such as phenylephrine will induce secretion of protective factors which increase the viability of cultured mouse cardiac stem cells (CSCs). NRVM pacing was performed similarly to McDonough et. al. Immunoblots, quantitative PCR and MTT assays were performed according to manufacturer protocol. NRVM imaging revealed that the cardiac myocytes did significantly increase in cell surface area, or hypertrophy in culture. Accepted markers of hypertrophy, such as Atrial Natriuretic Peptide (ANP) were found to increase in the secreted media of the NRVMs and Quantitative PCR revealed that ANP and its homolog, BNP were both up-regulated at the transcriptional level in the NRVMs. Viability of cardiac progenitor cells cultured in media from treated NRVM show increases in viability dependent upon density of donor secreting cells and increases in viability with paced and phenylephrine treatments. This study marks a step toward generating an effective in vitro model for studying inter-cellular interactions in the heart. While specific data explaining the identity and potential mechanisms associated with NRVM secreted factors have not yet been obtained, the proof of the principle that inter-cellular communication does effect clinically relevant phenotypes, such as metabolic viability, in heart cells is significant. Subsequent endeavors will involve more detailed assessment of CPC differentiation profile and probing for specific secreted factors from NRVMs.

299 1:15 pm

Characterization of vaginal colonization by methicillin-resistant *Staphylococcus aureus* Liwen Deng, Biology (D)

Staphylococcus aureus is an important organism responsible for nosocomial and community acquired infections in humans, and cases of community associated methicillin-resistant S. aureus (CA-MRSA) infection have continued to increase despite wide-spread preventative measures. Compared to antibiotic-susceptible strains, MRSA infections exhibit elevated mortality rates, require longer hospital stays, and exert a higher financial burden, all highlighting the severity of the growing MRSA problem. Reports have suggested an increase in CA-MRSA infections in pregnant and postpartum women as well as outbreaks in neonatal intensive care units and newborn nurseries. S. aureus has been reported to colonize the vagina in up to 22% of pregnant women, however little is known about the specific bacterial factors that promote vaginal colonization and subsequent infection. We hypothesize that S. aureus must express factors that mediate interaction with the vaginal epithelium and compete or cooperate with other common colonizers in order to promote niche establishment. We have adapted a mouse model of Group B Streptococcal vaginal colonization and demonstrate that invasive and colonizing MRSA isolates can persist in the murine vaginal tract. Further, we have also demonstrated that USA300, the most problematic MRSA lineage in the United States, attaches to human vaginal epithelial cells (HVEC) in vitro. We have previously shown that fibrinogen (Fg) is an important vaginal matrix component for bacterial colonization, thus we sought to investigate the importance of MRSA-Fg interactions for vaginal cell adherence. We have constructed single and combination USA300 mutants of Fg adhesins, including ClfA, ClfB, FnbpA, FnbpB, and SdrCDE. We observed that inactivation of multiple adhesins reduced Fg binding and the ability to adhere to HVEC compared to the parental strain. Future studies aim to determine the importance of Fg binding to MRSA vaginal colonization and polymicrobial interactions within the vaginal tract.

300 1:30 pm

Effect of 2-Hydroxyglutarate on GOT1 Activity: How Oncogenic IDH1 Mutations May Alter Cysteine Metabolism in Gliomas Diego Avellaneda Matteo, Biochemistry (D)

Gliomas are the most common type of brain cancer and they can progress to secondary glioblastoma multiforme, which have a five-year survival rate of <10%. Isocitrate dehydrogenase 1 (IDH1) is a metabolic enzyme that is mutated in ~80% of grade II/III gliomas and secondary glioblastomas. IDH1 is responsible for the reversible NADP+-dependent oxidative decarboxylation of isocitrate to α -ketoglutarate (α KG) in the cytosol and peroxisomes. Mutations of IDH1 found in tumors, most commonly at amino acid 132, confer a loss of this normal activity and, importantly, the gain of a neomorphic

function. This neomorphic activity is the NADPH-dependent conversion of aKG to 2-hydroxyglutarate (2HG). 2HG has been proposed to be an oncometabolite due to its ability to inhibit aKG-dependent enzymes, including DNA and histone demethylases. However, there are many enzymes that require α KG for activity, and we propose that 2HG resulting from mutant IDH1 activity can inhibit aKG-dependent aminotransferases. GOT1 is an aKG-dependent aminotransferase important for cysteine metabolism that uses cysteine sulfinate (CS) as a substrate. Concentrations of CS accumulate to significant levels in brain cancer cells. We hypothesize that the accumulation of CS is due to GOT1 inhibition by 2HG. We performed an intensive kinetic characterization of many brain and non-brain cancer associated IDH1 mutants and we identified mutations with high activity for 2HG production. From these studies, we selected IDH1 mutations with high (R132Q/H) and low production (R100Q) of 2HG and study the inhibitory behavior of 2HG in GOT1. This work will identify new pathways that contribute to tumor growth in mutant IDH1-driven cancers, potentially illuminating new therapeutic targets.

301 1:45 pm ATF6 Is Required For ANP Secretion From The Heart

Erik Blackwood, Cell and Molecular Biology (D)

Introduction: Atrial natriuretic peptide (ANP) is a potent depressor hormone synthesized and stored in the heart in secretory granules of atrial myocytes as a biologically inactive precursor, pro-ANP. Hemodynamic stress and neurohormones, such as the α -adrenergic receptor agonist, phenylephrine (PE) stimulate coordinate secretion and proteolytic cleavage of pro-ANP to its bioactive form, ANP, which promotes renal salt excretion and vasodilation restoring blood pressure. Endoplasmic reticulum (ER) protein folding is critical in all endocrine cells, such as the pancreas because insulin synthesis and folding in the ER of pancreatic β -cells is required for secretion of bioactive insulin. As important as atrial ANP is for normal cardiovascular physiology, ER protein folding and the role of the integral transcription factor. ATF6, which is activated in response to ER protein misfolding in the formation and secretion of bioactive ANP has not been previously examined.

Hypothesis: ATF6 is required for optimal secretion of ANP from the atria.

Methods: To address this gap in our knowledge, we knocked down ATF6 in primary cultured neonatal rat atrial myocytes (NRAMs) using siRNA and measured ANP expression and secretion basally and in response to PE. We also compared ANP secretion from wild-type (WT) mice and ATF6 knockout (ATF6 KO) mice in an *ex vivo* Langendorff model of the isolated perfused heart. Additionally, we subjected the WT and ATF6 KO mice to a salt-stress chow diet and compared their responsiveness to circulatory sodium overload and hypertension as well as the circulating ANP concentrations in blood plasma. Results: ATF6 knockdown in NRAMs significantly impaired basal and PE-stimulated ANP secretion. Similarly, in the *ex vivo* isolated perfused heart model, less ANP was detected in the effluent of ATF6 KO hearts, compared to that of WT hearts. Additionally, ATF6 KO mice demonstrated a greater sensitivity to sodium overload, *in vivo*, as evidenced by increased blood pressure and pathological cardiac hypertrophy.

Conclusions: As ANP is secreted in a regulated manner in response to a stimulus, we posit that ATF6 is required for adequate folding, trafficking, and secretion of biologically active ANP from the endocrine heart.

302 2:00 pm

Using the Planarian flatworm to investigate RING E3 ligase function in stem cell regulation and regeneration

John Allen, Biology (D)

Ubiguitin is a small polypeptide that is used by the cell to post-translationally modify proteins. Ubiquitin-mediated signaling is involved in a broad range of cellular pathways including DNA repair, transcription, cell cycle regulation and protein degradation. The specific effects of ubiguitinylation on a target substrate vary extensively depending on the certain nature of the ubiguitin attachment. How and when ubiguitin is attached to a substrate is a critical step in signaling that is dependent upon the action of enzymes referred to as E3 ubiquitin ligases. The biological functions and target substrates of many of the E3 enzymes remains poorly understood. We are utilizing the planarian flatworm Schmidtea mediterranea, with its large population of pluripotent adult stem cells, as an in vivo model to understand the role that E3 ligases have in stem cell regulation and regeneration. In this work, we are focusing on the largest class of E3 ligases, the RING finger-domain containing (RING-E3s); our primary aim is to uncover RING-E3s that are essential for stem cell regulation by perturbing ligase function using RNAi and characterizing the resulting phenotypes. We performed whole-mount RNA in situ hybridization to identify which cell types and tissues express specific RING-E3s. We found that a planarian homolog of Pre-mRNA processing factor 19 (Prp19) is strongly expressed in stem cells. When Prp19 was knocked down it presented a phenotype characteristic of stem cell depletion wherein animals display head regression and lyse. Interestingly, analysis of stem cell marker gene expression revealed that the Prp19 phenotype was not caused by ablation of the stem cells. To identify potential target substrates for identified RING-E3s, such as Prp19, we will examine changes in the ubiquitinylated proteome by mass spectrometry analysis after RNAi. This work will contribute to our understanding of how ubiquitin ligases determine the specificity of ubiquitin signaling and how ubiquitinylation regulates stem cells in the context of regeneration and during normal cell turn over.

303 2:15 pm

Identification of Halomonas-like traits as a novel biomarker for Nodding Syndrome-like epilepsy Adrian Cantu, computational science (D)

Nodding syndrome is a neurological condition of unknown etiology, affecting children between the age of 5 and 15 year, in onchocerciasis endemic areas in sub-Saharan Africa. NS is characterized by multiple epileptic seizures. Patients also experience cognitive and motor decline, wasting, stunting, behavior and psychiatric difficulties.

As part of a large effort to investigate the etiology of nodding syndrome associated epilepsy, blood plasma, buffy coat and cerebrospinal fluid samples were collected from eighteen afflicted children in the Titule, Democratic Republic of Congo. Plasma samples from nine healthy children from the same town were also taken as a control. All samples were treated to enrich viral DNA and sequenced using Illumina Hi-seq platform.

The resulting DNA sequence reads from all samples were then concatenated and assembled using a custom iterative cross-assembly method to generate a library of 38,733 contigs. All individual samples were then mapped to this library and the number of hits counted to generate a 38,733 x 63 matrix. A Random forest model was then trained on this matrix to assert which of the contigs in the library better differentiate patients with nodding syndrome-like epilepsy patients from controls.

The Random Forest model was able to classify the samples with 100% precision and 100% recall. All of the top ten contigs that better distinguish cases and controls contain parts of the Halomonas elongata genome. In particular, the top contig contains the gene for a putative protein of viral origin flanked by Halomanas elongata genome, suggesting an insertion site for a virus.

Taken together, those results seem to indicate that an Halomanas elongata phage plays an important role in nodding syndrome.

Session C-4

Oral Presentation: Behavioral & Social Sciences OR6 Friday, March 3, 2017, 1:00 pm Location: Aztlan

304 1:00 pm

What Influences the Decision Making Process of Food Ordering for Children at Restaurants? Can this Affect How Much Children Eat When Dining Out? Jessica Cerda, Psychology (U)

Previous research suggests that decisions about menu ordering at restaurants for children is often complex and parental control in decision-making varies (Pinard, et al, 2015). Little is known, however, about the influences behind these decisions and the resulting effects these influences have on children's food consumption when dining away from home. The current study seeks to explore the extent of control that parents have on meal ordering decisions for children at restaurants. Further, researchers seek to explain how other influences such as the sequence in which food orders were placed, and planning what to order beforehand, may affect the amount of food children end up consuming during a restaurant visit. The current study is a secondary data analysis of data obtained from the Kids' Choice Restaurant Program, an intervention to introduce healthier menu choices for children in restaurants. Interview data were obtained from 102 dining parties consisting of at least one child and one adult participant, as well as objective data collected through unobtrusive observations of parties during order placement at 10 sit-down restaurants in San Diego. Preliminary results indicate that 150 children were observed (51.3% female, 48.7% male) between November 2014 and February 2015. Parent or adult respondents identified as Hispanic/Latino 53% of the time. Findings from the current study may aid in understanding more about the intricate process of decision-making for children's meals away from home and possible approaches to shape children's behaviors in this context.

305 1:15 pm

Overall and Externalizing Symptomatology in Young Maltreated Children: Exploring Ethnic Differences Berta (Erika) Luis Sanchez, Psychology (M)

Maltreated children are at increased risk for adverse mental health outcomes. Minority children are disproportionately over-represented in child welfare and may be exposed to risk factors (e.g., poverty) associated with increased risk for detrimental outcomes. Whereas ethnic differences in outcomes have been identified, results are inconsistent. The present study aimed to further understand ethnic differences in early mental health outcomes among young, maltreated children. Data from the San Diego site of the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) project were examined. Caregivers of 4-year-old children (N=174) with a history of maltreatment and removal from the home were asked to identify the child's ethnicity (White, African-American, Hispanic or Mixed). Caregivers were also asked to complete the Child Behavior Checklist (CBCL; Achenbach, 1991) to obtain measures of symptomatology, including total problems, broadband externalizing behavior problems, narrowband aggressive behavior problems and delinguent behavior problems. Children in this sample were primarily female (54.6%), 28.2% were White, 39.1% African-American, 14.9% Hispanic, and 17.8% of Mixed ethnicity. Preliminary analyses showed ethnic differences in total problem scores ($F_{3,170}$ =2.91, p=.036) such that Mixed-ethnicity children had higher scores (M=38.19, SD=21.87) compared to African-American (M=26.66, SD=17.63), but not Hispanic (M=28.00, SD=15.48) or White children (M=32.33, SD=20.59). Similarly, marginal ethnic differences in aggressive behavior (F_{3,170}=2.64, p=.051) showed that Mixed-ethnicity children had the highest scores (M=14.43, SD=10.73) while African-American children had

the lowest scores (M=10.70, SD=6.70). The above patterns remained significant for boys only. Ethnic differences were also identified in delinquent behaviors (F_{3,170}=3.50, p=.017) with Mixed-ethnicity children showing higher scores (M=3.10, SD=2.97) compared to African-American (M=1.72, SD=1.88) and White (M=1.76, SD=1.84), but not Hispanic children (M=1.73, SD=2.03). However, this pattern was specific to female children. No ethnic differences were found in total externalizing scores ($F_{3,170}$ =2.18, p=.092). These results are partially consistent with health disparities research in that Mixed-ethnicity children with a history of maltreatment seemed to be at greater risk for adverse outcomes as compared to White children. However, such was not the case for African-American or Hispanic children. This highlights that the experience of minority children in the context of child maltreatment is complex and warrants continuing examination.

306 1:30 pm

One Way In And One Way Out Llewelyn Labio, Communication (M)

Preschools and childcare centers are important institutions in today's society. The increase of working mothers entering the force are staggering. This has changed the dynamics in American households as well as increased the need for childcare centers. This need for childcare has been filled with educational institutions attributing to the development of unique relationships formed among parents. The interaction that is communicated in these facilities are valuable beginnings of friendships that also become life-long relationships. Furthermore, the relationships formed are evidence of something happening in an environment meant for education while actually delivering more. The use of sarcasm facilitated bonding experiences among mothers that shed light into the everyday conversations that illuminate motherhood expectations. This qualitative study takes an ethnographic approach by observing the entrance way and hall of SDSU Children's Center. Multiple interviews were conducted during the drop off and pick up of children as well as numerous hours of observation.

307 1:45 pm

Neural Reactivity to Monetary Reward in the School-Age Offspring of Depressed Parents Karen Schwartz, Psychology (D)

Identifying neural profiles that may predict future psychopathology in at-risk individuals is important to efficiently direct preventive care. Alterations in reward processing may be a risk factor for depression. The current study characterized the neural substrates of reward processing in children at low- and high-risk for depression due to maternal depression status.

Children (5.93-9.63 years) performed a monetary incentive delay task during fMRI acquisition. The analytical model focused on

the Group (low-risk vs. high-risk) x Performance (hit vs. miss) x Condition (no reward vs. reward) interaction.

Final analyses included data from 46 children. The whole brain analysis of the threeway interaction yielded five significant clusters: dorsolateral prefrontal cortex (xyz=50,35,15; $F_{1,44}$ =20.01, k=71), parahippocampal gyrus (xyz=5,-32,6; $F_{1,44}$ =14.88, k=46), superior temporal sulcus (xyz=-44,-41,9; $F_{1,44}$ =14.76, k=32), dorsal prefrontal cortex (xyz=29,20,42; $F_{1,44}$ =13.68, k=21), ps<.05 corrected. All regions exhibited similar patterns, whereby the high-risk group showed blunted differences in activation between the no-reward and reward conditions when they hit the target, and differences in the opposite direction when they missed the target, compared to the low-risk group.

Region-of-interest analyses indicated significant three-way interactions in the putamen (right: $F_{1,44}$ =4.10, p=.049; left: $F_{1,44}$ =5.02, p=.030), right nucleus accombens ($F_{1,44}$ =4.84, p=.033), and left amygdala ($F_{1,44}$ =4.89, p=.032). The pattern of results was similar to that observed in the whole brain analysis; however, post-hoc tests did not survive correction.

Results suggest that children at high risk for depression are less able to flexibly and appropriately modulate their neural reactivity in response to different reward task conditions.

Session C-5

Oral Presentation: Humanities OR3 Friday, March 3, 2017, 1:00 pm Location: Metztli

308 1:00 pm

The GenX Files: The Search for Masculinity in 1990s America

Andrea Alvarado, History and English (U)

Social commentators of the 1990s identified a "masculinity crisis," noticing that men questioned their identities as a result of dual contradictory societal pressures. They typically employed one of three approaches when analyzing the crisis: historical analysis, feminist critique theory, and mythopoetic ideology. The literature and film of this time express an overarching theme for the search for masculine identity that incorporates elements of each of these approaches. While writers who employed historical analysis and feminist theories agreed that the identity crisis occurred as a culmination of social pressures during a time of structural change, the mythopoetics pinpoint the feminist movement as the root cause of the masculinity crisis. However, the mythopoetics fail to acknowledge the changing history of American masculinity and previous identity crises that occurred without the influence of a feminist movement.

The current historiography of the 1990s identity crisis has analyzed individual novels or films, sometimes referencing one of the approaches. However, no direct connection has been made between the films and novels of this time that dealt with masculinity. This essay seeks to take individual works from different disciplines and argue that an overarching style had been developed to depict the masculinity crisis. This distinct style included the use of duplicity and dual imagery to suggest the protagonists' psychological divide. Through the use of textual, psychological, and post-structural analysis, I analyze novels, films, memoirs, and other historians' research to show how this new "lost generation" of artists expressed the masculinity crisis.

The novels of the 1990s explored the duality of their characters through unique styles, such as dangerous writing, while the films featured male protagonists in liminal positions. Literature and film have the potential to promote subversion because they allow their audience to suspend their perception of gender ideals and experience a version that challenges their society's constructs.

309 1:15 pm

Zines, Polyvocality, and Sound: How Modernist First-Wave Feminism Inspired Riot Grrrl

Riley Wilson, English (U)

Although historians of riot grrrl tend to view this third-wave feminist movement in relation to its second-wave predecessors, riot grrrl's relationship to first-wave feminism and the modernist writings of its time is often overlooked. My research examines the ways in which riot grrrls such as Allison Wolfe, Tobi Vail, and Kelli Callis responded to and drew inspiration from first-wave modernist feminists such as Virginia Woolf, Margaret Anderson, and Jean Rhys.

The major argument of my presentation is that riot grrrl zines and the corresponding movement were both intentional and educated. Against mainstream media conceptions that these women were simply girls playing around, with little knowledge of what they were doing - and against present-day academic conception of riot grrrl as a response to second-wave feminism - I position riot grrrl as a conscious response to the radical writing techniques and DIY ethos theorized by writers such as Virginia Woolf. In comparing the auditory allusions of Mrs Dalloway and riot grrrl zines, in particular, I explore how women of both the early and late twentieth century used similar writing styles to instigate social change and advance feminist objectives. Just as many of Virginia Woolf's characters could not be typecast into traditional stereotypes and tropes of the era, so too did Olympian riot grrrls strive to break the mold of what a woman - especially a woman in punk - should or could be. Finally, by looking at the continuing influence on riot arrrl music and zines on feminist artists today. I explore how riot grrrl has helped modernist first-wave feminist idea to endure into even in today's digital world.

310 1:30 pm

The Interdependence of Women, Peace, and Security Leah Schroeder, International Security and Conflict Resolution (U)

In times of conflict and war, those who experience the most adverse effects tend to be the ones who generally don't participate in the battles and who had nothing to do with the conflict in the first place. Women (and children) often bear the brunt of violent conflicts, yet simultaneously are still more often than not excluded from both conflict prevention and a seat at the peace-building 'table'. In developing nations, this is particularly apparent; my research is focused on the Great Lakes Region of Africa (DR Congo, Rwanda, Burundi), and Senegal. Working on behalf of the Transnational Feminist NGO, Femmes Africa Solidarité (FAS), this research explores the work of FAS and other women's organizations in these areas of Africa in the implementation of UN Security Council Resolution 1325 on Women, Peace and Security (October 2000). For the first time in history, international legislation/agreement recognized women's role in preventing, mediating and resolving conflict. The body of this work surrounds the impact of women's grassroots networks and organization, especially on the transnational level, in helping to implement the framework of UNSCR 1325 into national laws and policies as well as ensuring the ideas translate into sustainable norms within their societies. In some areas there has been great improvement, while in many others, much work still needs to be done. I will address this, as well as a few questions and conclusions I have extrapolated from my research for two outside research papers.

311 1:45 pm

The Timeless Influence of Media in Political Campaigns

Imani Hollie, Communication (U)

Media has always been influential in American politics. The mass technological advances had allowed social media to make a strong everlasting impression. Many have suggested that social media has either ruined, heavily influenced, or completely changed the traditional view of politics. Social media has in fact changed politics. More specifically, social media has change what the voting audience is looking for in a candidate and in a political campaign. The change comes in the perception of candidates by voters. For example, voters focus not necessarily on what voters say, or how they look but on the personality they uphold. Through textual and historical analysis, this research aims to prove that media competency is necessary to connect with voters in order to accomplish a successful political campaign. Agenda setting theory and the uses gratification theory demonstrate why political candidates, for instance Ronald Reagan, Bill Clinton, Barack Obama, and Donald Trump were successful. Their success was possible due to their ability to adapt and appropriately use media mediums such as radio, television and social media to connect to the voter audience. This research identifies timeless communication practices, for example, image, authenticity and public communication competence, that can positively influence the success of future political campaigns.

312 2:00 pm

#MyFather'sWhiteHood: Stormfront's Cyberspace Hate Speech and Ideological Community Formation Kendra Straub, Communication (M)

In 1995, the first hate site on the internet Stormfront was created. Recently this website has become the breeding ground for the white nationalist resurgence, due to the usage of social media platforms like Twitter to mobilize community beyond the computer screen encouraging real-world action. This paper attempts to explain the role cyberspace hate speech and racialized discourse play in the community formation of white nationalism by analyzing tweets including #Stormfront. In this paper, I connect my critical self-portraiture of my father's recruitment by Stormfront to contemporary white nationalism to give insight to how this website has become a real group that can energize and mobilize a range of white supremacist members. Next, I connect Stormfront's usage of social media as a discursive tool. I explore how communication scholarship is well positioned to increase our understanding of social media community formations, ideology creations, and larger patterns of discourse surrounding race relations in the United States. I close by extending this argument beyond just Stormfront to the larger discursive implications of this social phenomenon.

313 2:15 pm

Nostalgia is Death but Whose Death? Susan Shamoon, Children's Literature (M)

After the post-modernism of the early 1990s, it seems like the past has never been as popular as it is today, and the sense of nostalgia born out of that loss and displacement, is a symptom of our age, a kind of historical emotion. History and nostalgia are common themes in contemporary culture, though the object of the nostalgic allure is elusive at best-popular culture is saturated with the sentiment, where visual effects are often used to recreate visions of the past, from reanimating extinct dinosaurs in Jurassic Park to movies centered around returns to childhood in Disney's The Kid. In many of these cases, the nostalgic feelings belong to adults who long to restore, not the past per se but universal values, such as family, truth, and a single national identity. Nostalgia inevitably reappears and is strongest as a defense mechanism in times of social and historical upheaval, but this type of defense mechanism is not without its own side effects. Nostalgia monopolizes and colonizes history and politics and does not allow for other viewpoints, and the twentieth and twenty-first century are characterized by the proliferation of different nostalgias, not for

a search for newness or any kind of forward trajectory. What this paper seeks to do is explore the implications of nostalgia when forced on young adolescents and teenagers, as well the critical ways in which the adolescent horror texts *Black Hole* by Charles Burns and *Paper Girls* by Brian K. Vaughan resist the cyclical nature of nostalgia.

Session C-6

Oral Presentation: Interdisciplinary OR1 Friday, March 3, 2017, 1:00 pm Location: Templo Mayor

314 1:00 pm

Post-fire hydro-geomorphic modeling after the 2012 Waldo Canyon Fire in Colorado Samira Nourbakhshbeidokhti, Civil Engineering (M)

Wildfire have significant impacts on hydrologic and geomorphic processes within watersheds. Post-fire sediment transport and runoff generation vary by burn severity, precipitation, and vegetation, which complicates hydro-geomorphic modeling and prediction. This research aims to model geomorphic and hydrologic processes in Williams Canyon, a watershed burned by the 2012 Waldo Canyon Fire in Colorado, to develop post-fire parameters for KINematic Runoff and EROSion (KINEROS) and Geo-spatial interface for Water Erosion Prediction Project (GeoWEPP). Pre-fire watershed characteristics are developed with Geographical Information System (GIS)-based data sets, including a digital elevation model (DEM), land cover, soil classification, and climate. Watershed parameters are adjusted to post-fire conditions using soil burn severity. Sediment yield is modeled over 18 months following the fire in KINEROS and GeoWEPP. To calibrate the models, high resolution Light Detection and Ranging (LiDAR)-based information is used and performance is evaluated by error objective functions. Three post-fire terrestrial LiDAR images were collected on 21 April 2013, 14 September 2013, and 16 September 2014 used to estimate total erosion and deposition. Baseline simulations (uncalibrated) from KINEROS estimated 3870-125 kg/ha of sediment. Compared to the LiDAR-based observations, the model overestimated erosion by 410% in the first year and underestimated erosion by 87.2% in the second year. After calibration, the root mean square error (RMSE) of sediment was reduced by 0.016% for the first year and 0.09% for the second year. The post-fire model parameters developed for Williams Canyon in the KINEROS framework will be transferred to GeoWEPP and evaluated. This modeling work will also be extended to other watersheds burned within the Waldo Canyon Fire. Results of this research will contribute to our understanding of wildfire disturbance on coupled hydrologic and geomorphic processes and ultimately improve post-fire model parameterization, which can be used to guide post-fire management and predictions.

315 1:15 pm

Language Dominance is Predictive of Cognate Effects and Inhibitory Control in Young Adult Bilinguals

Jonathan Robinson Anthony, Language and Communicative Disorders (D)

Studies involving bilinguals have described language dominance (proficiency of using one language over another) in discrete terms (e.g., English monolingual, Spanish-English bilingual). Studies of bilinguals' linguistic and cognitive (nonlinguistic) abilities have utilized categorical language profiles to group participants, though recent studies suggest that bilingualism is not a categorical variable. Our study examined the relation between dominance as a continuous variable and linguistic and nonlinguistic ability in bilinguals. We investigated whether dominance was predictive of linguistic knowledge (indexed by cognate effects) and nonlinguistic, inhibitory control (indexed by Stroop effects), as bilinguals manage two language systems. As individuals have more robust knowledge of cognate (e.g., trumpet-trompeta) than noncognate (e.g., knee-rodilla) words and perform faster on tasks without stimulus competition (congruent) than with stimulus competition (incongruent), word accuracy differences (cognate effect) and response time differences (Stroop effect) were of particular interest. Young bilingual adults (n=80) completed a language history questionnaire, a receptive and expressive language task in Spanish and English, and a Stroop task. We indexed dominance as a composite score of multiple measures: expressive and receptive language, self-reported proficiency, and language exposure (positive dominance values=English dominant, negative values=Spanish dominant, 0=balanced). Cognate effects were derived from the difference between cognate and noncognate accuracy across receptive language tasks, and Stroop effects were derived from accuracy and response time differences between congruent and incongruent trials on the Stroop task. We evaluated the variance in cognate effects and Stroop effects explained by dominance. Results indicated language dominance was significantly predictive of cognate effects (larger cognate effects in English were associated with larger negative dominance values, indexing Spanish dominance; larger cognate effects in Spanish were associated with larger positive dominance values, indexing English dominance). Results additionally indicated that absolute language dominance, or being more strongly dominant in one language or another, was predictive of Stroop effects, as larger absolute language dominance was associated with better Stroop inhibition. We discuss the relevance of language dominance as a spectrum as our findings suggest that linguistic and nonlinguistic systems may be relatively synchronized with degrees of language dominance as a multifactorial index.

316 1:30 pm

Ab initio calculations of Gamow-Teller transitions Jordan Fox, Computational Science (D)

Recent years have seen a tremendous improvement in rigorous ab initio methods for nuclear physics. Ab initio calculations differ from phenomenological models in that they start from two-body scattering data rather than being tuned to many-body spectral data, allowing for a more fundamental and robust description of many-body properties. The first step in my investigation is to analyze changes in Gamow-Teller transition strength functions — a particular kind of beta-decay — for increasing size of the model space. By using our configuration-interaction code, I have tested so-called effective interactions by computing many-body spectra for nuclei as well as transition strengths for Gamow-Teller transitions in the p-shell and sd-shell. These preliminary tests provide a foundation for effective theory analysis and further development of ab initio framework.

317 1:45 pm

Where Two or More are Gathered; Faith Development Among Black College Students Jonei O'Bryant, Sociology; Minor in Counseling and Social Change (U)

The purpose of this study was to explore how Black Campus Ministries (BCM) at Southwestern State University (SSU) could facilitate the intrinsic and extrinsic faith development of Black students. This is inclusive of students who identify as Christian as well as those interested in learning more about the Christian faith. This study is essential given prior research that religiosity and spirituality have an important influence on success for African-American students. Specifically, this research notes that when students feel that they have a connection to God, they in turn feel a greater sense of belonging in college, are inspired towards academic excellence, perceive a greater understanding of their purpose in life, and are resilient in overcoming barriers that they face. It was hypothesized that if one creates a space that encourages spiritual growth and connection with God for African-American students, then they will find an increase in spiritual and emotional health within the Black community. In order to test this theory, we used methods of Participatory Action Research (PAR) through informal interviews, observations, and journaling with students in BCM. Informal interviews were utilized to better understand the influence of an environment that encourages spiritual connection to God on the emotional and spiritual health of Black students at Southwestern State University. To date, this project has included over 500 hours of observations, 25 interviews, and 24 reflective journal entries. The results were consolidated to form three major themes of authentic communication, strategic networking and community-building. Collectively, these themes demonstrated that BCM has created safe space that encourages spiritual and emotional health through

connection with God. We observed that students experienced a more salient connection with God when they were part of a spiritual community that was warm, welcoming, and friendly. Implications for future research, practice, and institutional policy will be extended.

318 2:00 pm

Regional Hypoperfusion and White Matter Tract Degradations among Elderly Patients with Amnestic and Nonamnestic Mild Cognitive Impairment

Evelyn Locano, Psychology (U)

Older adults with mild cognitive impairment (MCI) have reduced cerebral blood flow (CBF), but it is unclear how hypoperfusion relates to microstructural changes to white matter tracts, and more specifically how these relationships might differ among subtypes of MCI. The purpose of the present study is to compare regional CBF in older participants with amnestic MCI (aMCI) and nonamnestic MCI (naMCI) and assess whether hypoperfusion in anterior and posteriors cortical regions of interest are associated with microstructural changes in white matter (WM) tracts connecting these areas. Using multimodal magnetic resonance imaging (MRI), these relationships were assessed by examining correlations between CBF and fractional anisotropy (FA) in WM tracts in vulnerable regions. 79 cognitively normal 57 aMCI, and 115 na MCI (M age = 72 years old) participants from the Alzheimer's Disease Neuroimaging Initiative (ADNI 2) underwent neuroimaging and memory testing. Arterial spin labeling MRI was used to quantify CBF and diffusion tensor imaging MRI was performed to measure FA degradations in WM tracts. Participants with MCI were rediagnosed using empirically validated criteria derived by Jak and Bondi (2014) and classified as either amnestic or nonamnestic. It is hypothesized that participants with aMCI will have greater hypoperfused regions of interest than participants with naMCI. However, when compared with cognitively normal older adults, it is hypothesized that both the aMCI and naMCI groups will have reduced CBF but there will be no significant difference in hypoperfused regions. It is also hypothesized that WM alterations in aMCI will occur most frequently in tracts connecting memory structures (posterior cingulate, medial temporal lobe), whereas naMCI will likely have more diffuse WM degradations (both anterior and posterior). If expected results support the hypothesis then they can suggest that although patients might all be diagnosed with a form of MCI, these individuals demonstrate distinct variations in neurovascular functions that underlie their different cognitive impairments and reflect a unique course of cognitive degeneration. Therefore, these results may be a utility in examining the differences between these MCI subtypes and may help us understand their progression and how it indicates pathology consistent with that of AD and other dementias.

319 2:15 pm

Collaborative Efforts Towards Connectivity Conservation: A case study of the Yellowstone to Yukon Initiative

Bridget Hicks, Geography (M)

The Yellowstone to Yukon Conservation Initiative (Y2YCI) is a collaborative partnership that aims to protect and connect the land and waters in the Northern Rocky Mountains through conservation methods (Yellowstone to Yukon Conservation Initiative 2014). As one of the few remaining largely unaltered mountainous landscapes in North America, the Yellowstone to Yukon region provides critical habitat for many threatened migratory species. The Initiative serves as an organizer and facilitator, connecting hundreds of partners on a collaborative mission for habitat connectivity. The partners range from government agencies, First Nations, and NGOs, to community groups and private landowners (Yellowstone to Yukon Conservation Initiative 2014). The Y2YCI is the largest and most successful initiative of its kind, yet little research has been conducted to understand the dynamics of the governance structure involved in the large-scale collaborative approach. This research seeks to investigate the collaborations between the partners and their roles, goals, motivations, and obstacles to participation. I will conduct surveys and interviews with the partners and the Y2YCI to understand the perceptions of the Initiative's outcomes and the structure associated with this polycentric governance approach. As of January 2016, I have 67 responses to the partner survey and 16 survey responses from Y2YCI staff members. I have conducted 5 interviews and have at least 10 more scheduled. The resulting themes from this case study research will be compared and contrasted to themes from the academic literature on collaborations and natural resource management.

Session C-7

Oral Presentation: Engineering & Computer Science OR2 Friday, March 3, 2017, 1:00 pm Location: Visionary Suite

320 1:00 pm

Penetrable Microelectrode Array In-Vitro Electrochemical Testing Alberto Perez Jr, Mechanical Engineering (U)

Detecting and understanding electrochemical fluctuations of the central nervous system will not only help but improve in the study of neural communications, specifically in examining abnormal neurotransmitter signals. Microelectrode Arrays have already been made for surface stimulation of the spinal cord. Our devices are designed to penetrate the spinal cord and reach the motor pool. Not only are we able to stimulate the motor pools, but we can also detect the amount of serotonin being produced as a result of stimulation using fast-scan cyclic voltammetry (FSCV) while still extracting the electrophysiological signal. The fabrication was done using a combination of layers which include SU8 (which forms into Carbon after pyrolysis), polyimide, and platinum or gold traces. *In vitro* testing was performed using an electrochemical cell, which consisted of a qualitative analysis of the device's effectiveness in an *in vivo* environment. The proper performance of the device is dependent on a low impedance which predicts for accurate cyclic voltammetry testing. *In vitro* results showed that the design was able to detect serotonin with a lower detection limit of 25nM while simultaneously recording an electrophysiological signal from the same electrode set.

321 1:15 pm

Two Dimensional Heat Transfer Analysis Within Non-Thermally Thin Poly(Methyl Methacrylate) That is Burned in a Narrow Channel Apparatus Nicholas Lage, Mechanical Engineering (M)

The San Diego State University (SDSU) Narrow Channel Apparatus (NCA) has been proven through comparison with the previous flame spread studies in the Microgravity Science Glovebox (MSG) experiments conducted on the International Space Station (ISS) to emulate microgravity flow conditions. The NCA replicates microgravity by flowing of mixtures of nitrogen and oxygen through a narrow gap in order to suppress buoyancy above the burning sample. The purpose for studying flame behavior in microgravity is to improve fire safety protocol for spacecraft as well as creating alternative measures to study microgravity flames that are much less expensive compared to flame spread experiments conducted on spacecraft.

Using Fire Dynamics Simulator (FDS), version 6.2.0, coupled with Gpyro, a two-dimensional model was developed for non-thermally thin samples of poly(methyl methacrylate) (PMMA) that are burned in the NCA. A fuel length of 30 mm is used as well as a 5 mm gap height and the assumption that the flow at the inlet is laminar and parabolic. With the postulation of laminar flow based on the flow Reynold's number, direct numerical simulation (DNS) is used to solve the momentum and energy equations for the flow. A complex pyrolysis model is used to simulate the decomposition of PMMA into methyl methacrylate (MMA) vapor, which consists of a first order, single step Arrhenius reaction rate equation. A second order, single step Arrhenius reaction rate is used to model the combustion reaction of MMA vapor with oxygen. Complete combustion is assumed.

Simulations with varying fuel thicknesses were ran to analyze their effect with flame spread. A comparison between one-dimensional and two-dimensional heat conduction within the solid is also made to show the effect the heat transfer parallel to the direction of flame propagation has on flame spread rate as well as on aspects of ignition.

322 1:30 pm

Numerical Simulation of Convective Cooling by a Wall Jet along a Convex Surface Keyu Dhingani, Mechanical Engineering (M)

In this research the general case of a wall jet on a convex surface is computationally studied to understand the fluid dynamics and heat transfer. The motivation for this project is to cool the window of a high temperature solar receiver below 800oC through convective cooling using a wall jet over it. As the temperature inside the Small Particle Heat Exchange Receiver (SPHER) located at the top of the Solar Tower can reach up to 1000oC, the receiver window made up of quartz glass has the dangers of structural failure if not cooled.

The eventual goal of the computations is to simulate the wall jet flow over a quarter-scale physical model of the solar receiver window available at Combustion & Solar Energy Lab at San Diego State University, so that the experimental results can be compared with the computational results. In this thesis, the first efforts toward that goal are presented.

A 2-D receiver window model is created in FLUENT, which has two inlets at either side of window. A grid study on seven 2-D grids is performed using a jet inlet velocity of 1 m/s and inlet nozzle size of 1 mm to achieve mesh independence as well as time-step independence for transient calculations. Laminar and turbulence models are used to perform steady state and transient computational simulations with varying jet inlet velocity but constant inlet nozzle size of 1 mm. The results of the laminar steady state computations are compared with analytical solutions from the literature showing the agreement between the two. Turbulent cases did not converge and more work is needed on them.

A heat transfer analysis is performed with zero jet flow to compare the results achieved by the numerical calculations with analytical results based on conduction heat transfer. Then with the jet flow using laminar model, a heat transfer analysis is done for cooling the window, which has variable heat flux applied over its surface. The result obtained shows that the cooling is achieved near the inlet but there is no cooling at the top, indicating higher inlet speeds are needed.

323 1:45 pm

Optimized Solar Tower Receiver Philip Hoskinson, Mechanical Engineering (M)

Investigation of Solar Flux behavior on narrow channels for a Near Black Body (NBB) particle receiver, for use with Concentrated Solar Power applications. MATLAB code will be developed for post processing output-data from proprietary ray-tracing programs from the National Renewable Energy Laboratory (NREL) i.e. SOLTRACE. Results will analyzed and used for possible optimization of solar flux spread, minimizing thermal gradients etc. C++ code will be generated for SOLTRACE software-language for compilation of large ray-numbers, so that statistical methods can be used to accurately model solar flux behavior.

324 2:00 pm

Integration and Testing of a Concentrated Full-Spectrum Optimized Photovoltaic Thermal Hybrid Solar Collector

Naman Gupta, Mechanical Engineering (M)

Full spectrum optimized solar cells have multiple p-n junctions made from different semiconductor material which allows the absorption of a broader range of wavelengths which improves cell's conversion efficiency. Each material's p-n junction produces electric current in response to a different wavelength of light.

The PV module designed at Tulane University, a partner on our project, is a 7 X 7 square array of full-spectrum optimized PV cells with each cell measuring 5.5mm x 5.5mm square.

As per the process of generating electrical energy and thermal energy necessary for various commercial purposes, the solar radiation will be collected by the parabolic dish collector and a concentration ratio of 500x will be received by the PV cell array which is enclosed in 5 mm thick and 4 cm radius sapphire glass fixed in an active cooling collar with conversion efficiency greater than 40%.

Active cooling of the module is done via water flowing in 100 µm channels, which are fixed below the PV cells to increase efficiency by lowering resistance induced due to high temperature. The transmitted light is received by a thermal receiver (heat exchanger) to heat the water/oil inside a channel which is in shape of serpentine with dimples to increase the pressure drop and heat exchange rate.

The goal of the current project has been to assemble and initially test the designed CPV/T system at San Diego State University's Combustion and Solar Energy Laboratory under a high flux solar simulator which has a 15kW Short Arc Lamp with peak flux over 1400 kW/m^2 and total optical power 3.5kW over the CPV array. Temperature profiles and electrical output are used to measure the efficiency of the CPV and thermal receiver. Efficiency graphs for different levels of simulated cloud cover are also obtained.

325 2:15 pm

Inverse Identification of Damage in Composite Laminates using Electrical Resistance Tomography Paulina Diaz Montiel, Engineering Sciences (D)

Non-destructive evaluation (NDE) techniques to detect and measure internal inter-ply delamination and intra-ply matrix cracking damage are needed for Carbon Fiber Reinforced Polymer (CFRP) materials used in aerospace structures. The electrical resistance tomography (ERT) is a NDE technique that uses the inherent changes in conductive properties to characterize damage.

Identification of damage using ERT requires solving the inverse problem that minimizes the difference between the model predicted and the measured change in resistance at specified electrode locations. Using numerical finite element models of the laminate directly in the inverse identification is computationally expensive and requires the development of an accurate surrogate model.

This research investigates efficient numerical modeling techniques for inverse identification of delamination damage location and size in composite laminates using ERT based NDE. Traditional ERT approaches are focused on damage detection. For structural health prognosis, in addition to detection, the inverse identification also has to accurately quantify the damage.

In this work, an inverse problem is formulated as a nonlinear, unconstrained, multivariate and mixed optimization problem, to identify and quantify delamination damage in composite laminates with different stacking sequences. The optimum solution of this problem consists of delamination crack size, crack horizontal position and crack vertical position. The use of surrogate models is implemented in the optimization to compute model predicted responses, and reduce the computational expense.

Using these techniques, delamination damage in two composite laminates with different stacking sequences was accurately identified and quantified using Kriging surrogates. In addition, it was found that ERT for damage detection is much more sensitive to crack size and crack horizontal position, than crack vertical position.

Session C-8

Oral Presentation: Physical & Mathematical OR3 Friday, March 3, 2017,y 1:00 pm Location: Legacy Suite

326 1:00 pm

Monofonuctionalization of Pyrogallol[4]arene Cesar Garcia, Chemistry (U)

Pyrogallol[4]arene is a curved, hydrogen-bonding molecule that is capable of self-assembling in solution to form molecular capsules. These capsules enclose approximately 1300 Å³ of space, enough to trap up to seven or eight small molecules and isolate them from solution. As a part of our studies on these capsules, we hypothesized that a new way to control guest release could be engineered by attaching polymers to the capsules. With this design, mechanical forces pulling on the polymers would be transduced to the capsule, releasing the contents. But the attain such a new molecular capability, the capsule must be modified with chemically reactive handles for polymer attachment. We developed a new synthesis to enable these modifications. The synthesis of mono-functionalized pyrogallolarene begins with attaching 0–4 terminal alkenes to the capsule. What follows is an olefin metathesis with benzyl acrylate. Finally, hydrogenolysis of the esters results in pyrogallolarenes with carboxylic acids on the lower rim of the capsule. However, because the molecule may contain 0-4 carboxy footed chains, it is important to be able to separate the capsules that only contain one terminal carboxylic acid.

Attempts have been made to separate monofnctionalized pyrogallolarene with conventional methods such as flash chromatography and the use of DIOL columns. This approach has been unsuccessful so far. Another direction is assessing our ability to protect the alcohol groups in each hexamer and attempt a separation where the only alcohol groups are located in the terminal carboxylic acids. We have been able to protect and deprotect the capsule effectively, and experiments to purify the protected compound are underway.

327 1:15 pm

Solar Fuel Conversion in the Hydrogen Evolution Reaction using a Novel Sulfide Catalyst Antonio Trammel, BioChemistry (M)

The growing demand for energy will be a critical issue until we find a safe sustainable energy source other than our current predominate source of fossil fuels. Currently, research is oriented on finding and developing a source of renewable sustainable energy in the form of solar fuels, which converts water into hydrogen gas utilizing solar energy. Moreover, the present catalysts used for solar fuel conversion rely on precious earth metals such as platinum, are expensive and scarce for commercialization standards. Herein, our research focuses on the development of a novel and efficient sulfide catalyst film that is prepared via cost effective electrodeposition method on a conductive glass surface and be implemented in a hybrid semiconductor for the conversion of water into hydrogen gas. The presence of the sulfide catalyst film on the conductive glass will be confirmed using techniques such as TEM, XPS and XRD. In the future, this cost effective catalyst might be a viable tool for solar fuel conversion on an industrialized scale.

328 1:30 pm

Atroposelective Organocatalytic Nitroalkylation of Napthoquinones

Ryan Noorbehesht, Organic Chemistry (M)

The development of direct C-H functionalization methodology has received a lot of attention amongst the turn of the century. The most popular approach has been through the use of transition metal catalysis. Many of these methodologies unfortunately are restricted to substrates that contain synthetic handle to direct the regioselectivity of the transition metal catalyst as well as the use of harsh reagents. Methods that function through an organocatalytic method under mild conditions are few and far between. The most recent method of C-H functionalization using quinine as an organocatalyst, which has been shown by Mukherjee et al. This provided a facile method of C-H alkylation through what seems to be a 1,4-nucelophillic addition of various nitro alkanes. This method also provides great enantioselectivity of a distal prochiral center via desymmetrization using an enantiotopically selective conjugate addition. The substrates used by Mukherjee et al. (2,2-disubstituted cyclopentene-1,3-diones) are ubiquitous in many natural and synthetic bioactive molecules which lends to the significance of this

chemistry. Additionally, this chemistry is well suited to be used on a multitude of $\alpha,\,\beta,\text{-unsaturated dione systems.}$

Our work in the Gustafson has shown that diaryl ethers of naphthoguinones provide a suitable substrate for this enantioselective organocatalytic nitro alkylation. What is interesting about this is that the catalyst used in this scenario is a quaternary ammonia salt of the same organocatalyst Mukherjee had used. It turns out that the ammonia salt significantly enhances the enantioselectivty of the nitro alkylation into the atropisomeric diaryl ether, affording a modest dynamic kinetic resolution. The addition of sieves in this reaction also resulted in a dramatic increase in the yield, which suggests that the presence nitrous acid plays a crucial role in the rate of this reaction. This begs the question as to what is occurring mechanistically and how can it be used to further augment this already fascinating reaction. As a result of our work, we are well on our way to establishing an atroposelective 1,4- nucelophillic addition into α , β ,-unsaturated dione systems.

329 1:45 pm

Ruthenium Monoisomerization Catalyst: Studies in Selectivity Erik Paulson, Chemistry (D)

In the development of small molecules in plastics, fragrances, and the pharmaceutical industry, alkenes are incredibly versatile functional groups in their synthesis, owing to the diverse set of reactivity alkenes possess. It becomes imperative to selectively produce a host of individual isomers depending on the desired final product. Along this vein, we have developed a coordinatively unsaturated ruthenium catalyst that is capable selective isomerization of unfunctionalized linear 1-alkenes to E-2-alkenes with >95% yield. This preferential monoisomerization of 1-alkenes is catalyst controlled, allowing for broader substrate scope as opposed to most monoisomerizations,1 that are substrate-controlled.

NMR and UV-vis studies have offered heretofore unseen insight as to how the increased selectivity occurs. We will highlight the differences in reactivity between this monoisomerization catalyst and earlier, less-selective catalysts to shed light on the modes of reactivity.

330 2:00 pm

Evaluating insertion kinetics of unnatural tC nucleotide into DNA using viral reverse transcriptase Marc Turner, Biochemistry (D)

Nucleoside mimetics has been a promising field in the greater scope of biotechnology with regards to pharmaceutical and probative value. Compounds like 2-aminopurine (2-AP) are used for fluorescent visualization of nucleic acids, however 2-AP quenches in double-stranded DNA and other techniques for nucleic acid visualization such as azide-alkyne click chemistry require fixing (killing) cells. Tricyclic cytidine (tC) analogues are inherently fluorescent due to a modified ring structure of the

natural cytosine nucleobase and remain fluorescent when base stacked. They are minimally perturbing to duplex structure, which makes them potentially valuable tools in studying nucleic acids intracellularly. In this context, our interest focuses on studying viral DNA. In this work, we included fluorescent tC nucleoside triphosphates as substrates in single-insertion kinetics experiments under steady-state conditions using two viral reverse transcriptases. Using varying concentrations of the tC nucleotide, natural dCTP, and reverse transcriptase from either avian myeloblastosis virus (AMV-RT) or Moloney murine leukemia virus (MMuLV-RT), we assess the kinetics of single nucleotide insertion as well as enzyme processivity and discrimination. Other than the conventional template strand with an initial unpaired G base, three other templates have either A, C, or T; since one of the tC tautomers can base pair with adenine and determining the enzymes' discrimination is important for designing future applications. Another template strand has four consecutive G bases to measure how processive the enzyme synthesizes DNA. Preliminary kinetics results show that AMV-RT has a higher KM when using natural nucleotide relative to tC nucleotide. Nucleoside analogues have conventionally been used as inhibitors of viral enzymes, however the toolset of tC analogues provides the opportunity of a more probative alternative to study the replication properties of viruses intracellularly as well as tracking genomic material in a dynamic manner.

331 2:15 pm

Nucleophilic Dynamic Kinetic Resolution of Atropisomeric Naphthoquinones Towards the Synthesis of Unique Chiral Scaffolds for Catalysis Sean Maddox, Organic Chemistry (D)

Atropisomerism is a form of chirality, which differs from normal point chirality in that the chirality is about a bond (i.e. aryl-aryl bonds), hence racemization can spontaneously occur via bond rotation. Our lab has recently exploited this stereochemical phenomenon to increase kinase inhibitor selectivity. While we have since focused our efforts on the catalytic enantioselective synthesis of these kinase inhibitors, we also wanted to explore the atroposelective synthesis of new chiral scaffolds towards the design of unique chiral catalysts and ligands. The atroposelective synthesis of new chiral ligands from "feedstock" molecules offers an attractive approach towards adding unique scaffolds and geometries (which are currently unavailable) to the arsenal of catalysts used for enantioselective transformations.

We have recently focused our efforts toward the synthesis of atropisomerically pure naphthoquinone-aryl analogues. This approach results in a variety of functionality in our chiral product, which allows us to structurally diversify the enantioenriched product towards the synthesis of various chiral catalysts and ligands. We have achieved a general Dynamic Kinetic Resolution (DKR) of rapidly racemizing atropisomers via the nucleophilic addition of thiophenol into a rapidly interconverting naphthoquinone-aryl atropisomer. We have found cinchona alkaloid catalysts can efficiently catalyze the nucleophilic addition of thiophenol into the quinone moiety of a rapidly interconverting naphthoquinone-aryl scaffold, affording atropisomerically stable 1,4-diol scaffolds in high yields and enantiomeric ratios (i.e. 98% yield, 96:4 enantiomeric ratio). This is an unprecedented approach towards the enantioselective synthesis of atropisomers with diverse substitution patterns. Furthermore, we have extended this DKR to the enantioselective synthesis of other common structural motifs such as diaryl ethers, a first-in-class transformation. This new catalytic methodology holds the potential to increase the efficiency of synthesizing enantiomerically pure atropisomeric ligands, which offer unique catalytic active site geometries and conformations.

Session C-9

Poster Presentation: Biological & Agricultural Sciences P3 Friday, March 3, 2017,12:30 pm Location: Montezuma Hall

332 12:30 pm

Preventing Proliferative ERK Activation following AKT-mTOR Inhibition in Head and Neck Squamous Cell Carcinomas (HNSCCs)

Esteban Delgado, Biochemistry (U)

Squamous cell carcinomas of the head and neck (HNSCC) are a major public health concern. The majority of HNSCC lesions, which harbor genetic and epigenetic alterations, converge on the persistent activation of the PI3K-AKT-mTOR pathway. As a result, mTOR inhibitors (e.g., Rapamycin) exert a beneficial response in HNSCCs. However, numerous studies have shown that Rapamycin increases ERK phosphorylation, thereby suggesting a potential mechanism of therapeutic resistance. HNSCC cell lines displaying activated mTOR (Cal27 and Cal33), were treated with small molecule inhibitors that target the PI3K-AKT-mTOR pathway. Such drugs included inhibitors of AKT (MK2206), PI3K (BYL719 and, BKM120), mTOR (Rapamycin and Ink128), and PI3K and mTOR combined (PKI587). We also studied the cells' biochemical and antitumor responses to these targeting agents. These HNSCC cells experienced a decrease in mTOR activation and cell viability as a result of the targeting agents. Interestingly, MK2206, Ink128, PKI587, and Rapamycin (except for BYL719 and BKM120) increased ERK pathway activation. In addition, combination of Rapamycin with Erlotinib, an EGFR inhibitor, prevented ERK activation. Inhibition of the mTOR and AKT pathway in HNSCC, but not PI3K, may lead to ERK signaling activation and in turn, ERK may confer potential resistance to the mTOR targeting agents in this disease. As EGFR inhibition prevents ERK activation, we can predict that the combination of mTOR and EGFR inhibitors in HNSCC cells could serve as an ideal precision molecular therapeutic option, which may ultimately benefit HNSCC patients in the clinic.

333 12:30 pm

IFN-γ regulation of anti-tumor immunity in prostate cancer cell lines

Marisela Martinez Arroyo, Bioengineering (U)

One in every seven men will be diagnosed with prostate cancer (PCa) annually; however, PCa does not impact all races equally. African American (AA) men have higher incidence (1.6x) and mortality (2.3x) rates compared to Caucasians (CA). Previous studies showed differences in immune response genes HLA-DPA and HLA-DMB (128- and 8-fold higher in CA, respectively) at the RNA and protein level. MHC class II molecules such as HLA-DPA and -DMB, are typically found on antigen presenting cells in order to activate the immune response. However, epithelial cells, such as those found in PCa, can be induced by IFN-y to express these molecules via the class II transactivator (CIITA), the major transcriptional activator of MHC class II expression. If CIITA and MHC class II molecules are inducible by IFN- γ in PCa cell lines, then these cell lines can be used as an in vitro model to investigate the disparity of class Il expression. To test this hypothesis, two PCa cell lines derived from AA (E006AA-hT and MDA-PCa 2b) and two derived from CA (PC-3, DU-145) patients will be treated with 400IU/mL IFN-y for 0, 2, 4, 8, 16, 24, 48, and/or 72 hours. Immediately following, cells are harvested. RNA is extracted, converted to cDNA, and analyzed using quantitative PCR (qPCR) to determine the optimal time of CIITA gene expression. Flow cytometry is performed on live cells to detect the optimal time of MHC class II protein expression (HLA-DR, -DP and -DM). Preliminary gPCR results indicate CIITA is detected the highest ($\Delta\Delta$ ct = 3 compared to untreated cells) in E006AA-hT at 16hr. Flow cytometry revealed MHC class II HLA-DR protein is detected on ~2% of cells at 24H, ~44% at 48H, and ~59% at 72H. The other cell lines are in the process of being tested for CIITA and MHC class II expression. These preliminary data indicate that the PCa cell line E006AA-hT is IFN-γ inducible via the CIITA and can up-regulate MHC class II expression, suggesting the cell lines may be an adequate model to study MHC class II expression in PCa.

334 12:30 pm

H. pylori infection results in increased miR-21 expression in gastric primary and cancer cell lines Martin Somo, Biology (U)

Helicobacter pylori infection has been implicated in 80 percent of gastric cancers and is thought to be due to the increased reactive oxygen species (ROS) in the gastric epithelia. MicroRNA are small RNA that are 21-25 nucleotides in length that contribute to the regulation of gene targets and have been implicated in carcinogenesis and progression. Using microarray data we examined microRNA gene expression in the human gastric cancer cell line, AGS, following infection with *H. pylori*. miR-21 is of interest because its expression increases with *H. pylori* infection and has been shown to target ROS genes. Previously this upregulation was demonstrated in cancer cell lines or tissue samples but has not been evaluated in primary gastric cells. We hypothesize that the upregulation of miR-21 during *H. pylori* infection contributes to the regulation of ROS and inflammatory response.

Human primary gastric epithelial cells (PGEC) and AGS cells were infected *H. pylori* at MOI 100 for up to 24 hours. RNA was extracted from the cells and cDNA was generated to measure miR and gene expression levels. Following infection of PGEC or AGS cells by *H. pylori* 26695, miR-21 expression increased at multiple time points for both cell lines compared to uninfected cells. Immune response related genes, TNF? and IL-8, increased for the first 6 hours of infection. ROS related genes increased at 9 and 24 hours post infection. AGS transfection with miR-21 mimic and inhibitor showed either increased or inhibition of, respectively, miR-21 expression.

A significant increase of miR-21 occurred following *H. pylori* infection in gastric cells. TNF α increased initially but decreased when miR-21 was at its highest expression level suggesting a possible correlation which will require further investigation. The use of PGEC is a novel system which allows a better understanding of the response by gastric epithelial cells to infection. miR-21 may be acting within the gastric epithelium to regulate ROS and the immune response following *H. pylori* infection. Future steps include evaluating the effects of different *H. pylori* strains in both cell lines. Additionally, we will determine if the overexpression of miR-21 produces effects replicating an *H. pylori* infection.

335 12:30 pm

The impact of engineered bacterial minicells on tumor progression and inflammation in a mouse model of colon cancer

Nairika Meshign, Biology (U)

Colorectal cancer (CRC) is the second leading cause of cancer related deaths in the US. The immune system plays a critical role in the progression of cancer, having defenses that can help both the host and the tumor. Anti-tumor immunity assists the host in killing the tumor but pro-tumor immunity assists the tumor by recruiting myeloid cells that promote malignant tissue growth. To better understand the role of the immune system in CRC, we utilized a mouse model where the Apc gene, a tumor suppressor, is conditionally knocked out. This causes colonic polyps to form around 15 weeks of age. This model leaves the immune system intact for our studies.

Engineered bacterial minicells (VAX-IP) are spherical nano-sized particles formed in a mutant strain of *E. coli*, and are utilized as a potential therapeutic agent. They lack bacterial chromosomes, thus they are unable to undergo replication. VAX-IP function by targeting integrins on the surface of tumor cells and delivering a toxic protein that rapidly kills the tumor cell. Mice were dosed $(1.5x10^9 VAX-IP/mI, 1 dose/week)$ either from 8-13 weeks of age before lesion development, or from 14-19 weeks of age when lesions have started to form, and then harvested at 26 weeks of age. There was a significant reduction in tumor number in VAX-IP treated mice from both the 8-13 (p= 0.015) and 14-19 (p= 0.015) week treated groups.

Immunohistochemistry staining for myeloid cells using the marker CD11b showed a significant decrease in VAX-IP animals treated at 14-19 weeks of age (p=0.003) but not in 8-13 weeks (p=0.4) or parental control (p=0.9) groups. Staining using the macrophage marker F4/80 was done to better characterize the population of CD11b⁺ cells, but no significant decrease in the VAX-IP treated groups from 8-13 weeks (p=0.65) and 14-19 weeks (p=0.23) was discovered (parental data to be included). A choloroacetate esterase stain showed a significant decrease in granulocytes and mast cells for VAX-IP treated animals (p= 0.03). These data support the conclusion that VAX-IP is a therapeutic agent that reduces tumor load and inflammatory cell infiltration in our mouse model of CRC.

336 12:30 pm

Anti-Human TNF treatment of a mouse model that overproduces TNF and develops ileitis and arthritis. Jonathan Plascencia, Biology (U)

Inflammatory bowel diseases such as Crohn's disease and ulcerative colitis are chronic inflammatory diseases of the gastrointestinal tract. Due to this irregular form of inflammation, it has been noted that patients with a long-lasting case of IBD are more likely to develop colon cancer than those who don't suffer from IBD. Tumor necrosis factor (TNF) is a cytokine that plays a key role during inflammatory bowel diseases. Antibodies that neutralize TNF such as Infliximab are commonly used to treat IBD. The specific aim of this experiment was to test the human TNF inhibitor. Infliximab (IFX), on TNF∆ARE mice. TNFARE mice are inflammatory bowel disease models that develop chronic inflammation in the ileum due to a deletion in the AU-Rich elements of the TNF gene. To determine whether these mice reduce ileitis, the antihuman -TNF drug IFX was introduced to 5 TNF∆ARE mice over a 2-week period every other day. After two weeks of treatment, all ten TNFARE mice (Control and IFX-treated groups) all around 8-16 weeks of age were euthanized. Their ilea were harvested for histology and mRNA. The spleen and mesenteric lymph nodes (MLN) were collected to assess the size of the organs and later passed through a 70um cell filter to calculate the cellularity of the organs through a single cell suspension. After analyzing all of the data, the use of IFX during the 2-week period showed a minimal change in the treated TNFARE mice.

337 12:30 pm

Genetic Analyses of Mouse Repeats Important in Aggressive Colorectal Cancer Jennifer Luu, Biochemistry (U)

Background: Colorectal Cancer (CRC) is the second leading cause of cancer-related deaths in the United States. In CRC there is a significant racial disparity between African Americans and Caucasians. Elevated microsatellite alterations at selected tetranucleotide repeats (or EMAST) has been found to be a biomarker for aggressive CRC because it is associated with inflammatory responses that promote tumor growth and invasion. EMAST is found through insertions/deletions of tetranucleotide repeats in the DNA and it is more common in African American tumors. Studies on EMAST have been limited because of the low availability of human samples and a lack of an appropriate animal model because EMAST hasn't been demonstrated in mice. My aim is to look at specific tetranucleotide repeats in mouse tumors to see if there is EMAST in mice. My project would help show that EMAST can be found in a mouse, thus leading to the bigger picture that EMAST can be studied in a mouse model.

Methods: Previously in our lab, 1,447 potential mouse specific sequences that are likely to be unstable have been identified using bioinformatics. From these sequences ten were initially chosen to design primers. The primers were then used on these repeats to amplify them by PCR, and the products underwent DNA sequencing. The primers were tested in both normal colon and tumor tissue to identify repeat number differences between normal and tumor tissue, i.e. EMAST.

Results: Currently, three out of nine sequences tested have shown EMAST in tumors, four out of these nine sequences display instability in individual mice, and five out of seven large and invasive tumors tested show EMAST in our mouse model of CRC.

Conclusion: For the first time ever, we have shown that EMAST can be found using a mouse model of cancer. Further testing and sequencing on tumors will be done throughout the year along with PCR until 5-8 markers are found, comparable to the panel of EMAST markers used in human studies. These can then be used for future studies of EMAST in any mouse model of cancer, regardless of the type.

Session C-10

Poster Presentation: Behavioral & Social Sciences P6 **Friday, March 3, 2017,12:30 pm** Location: Montezuma Hall

338 12:30 pm

Electrophysiological effects of orthographic neighborhood in a letter detection task Stephanie Osmond, Psychology (U)

A large literature now examines how a variety of lexical factors modulate N400 amplitude, but almost exclusively in tasks that require lexical processing. In these lexically-oriented tasks,words(e.g., drug)with more neighbors (e.g., drag, drum, rug)elicit larger amplitude N400s than words (e.g., tofu) with fewer neighbors. The present study examines whether or not this evidence of co-activated neighbors can also be found in the context of a superficial form-level task. ERPs were recorded as participants decided whether or not a target letter was present in words from high- and low-density orthographic neighborhoods. Behavioral responses were faster overall for target-present stimuli, but were not affected by neighborhood density. N400 amplitude was also sensitive to target presence such that target absent trials elicited larger amplitude N400s than target-present trials. Interestingly, the presence of the target letter appeared to determine whether or not neighbors were co-activated. When the letter was absent, the classic N400 orthographic neighborhood effect was observed. However, when the letter was present, there was no effect of neighborhood on N400 amplitude. Together, these data suggest that neighbors can be activated in a form-level task, but that early identification of the target letter terminates lexical processing prematurely, thereby minimizing spreading of activation to neighboring lexical nodes.

339 12:30 pm

Influence of linguistic, cognitive and musical skills on symbolic learning in monolinguals and bilinguals Claire Duffy, Speech, Language, and Hearing Sciences (U)

Research suggests bilinguals often outperform monolinguals on word learning, but it is unclear whether these strengths translate to other domains of learning. While bilinguals may have advantages learning a linguistic system (Kaushanskaya, 2012), monolingual and bilingual performance on learning a non-linguistic system has yet to be determined. Our research employs tones corresponding to visual symbols to investigate learning in bilinguals and monolinguals. A 2x3x2 factorial design created a symbolic system including tone quality (sine wave, square sine wave), pitch (160HZ, 440Hz, 720Hz) and tone length (1000ms, 400ms). These were presented in images through color (black, grey), bar height (low, medium, high), and bar length (long, short), respectively. Twenty-five monolinguals and 33 bilinguals learned 12 tone-visual stimulus pairs. Utilizing participant results, we hope to determine how linguistic skills, cognitive skills, and musical background may influence monolingual and bilingual learning. Our investigation may reveal factors that predict how monolinguals and bilinguals process non-linguistic systems.

Preliminary findings utilizing regression analyses suggest that the number of training cycles needed to learn the three symbolic dimensions (quality, pitch, duration) had unique predictors, including previous vocabulary knowledge (PPVT; Dunn, Dunn & Dunn, 1997), morphosyntactically-based visual-auditory learning (Woodcock, McGrew, & Mather, 2001), musical experience (MUSE questionnaire; Chin & Rickard, 2012), and nonverbal reasoning (WASI; Wechsler, 1999). Likewise, higher vocabulary scores, better visual-auditory learning, and more musical experience also predicted overall non-linguistic learning success for monolinguals and bilinguals. While bilinguals and monolinguals had similar scores on the visual-auditory learning task (bilinguals: M=93.6,SE=2.2; monolinguals: M=86.4,SE=4.8, p>.1), visual-auditory learning skills more strongly predicted learning success in bilinguals (number of learning cycles needed: R2=.10; performance accuracy: R2=.13) than monolinguals

(number of learning cycles needed: R2=.004; performance accuracy: R2=.002). In conclusion, higher scores on the non-linguistic learning task depended directly on vocabulary knowledge, musical experience and nonverbal reasoning, but auditory-learning tasks predicted stronger learning performance more so for bilinguals than monolinguals. Differences may be due to bilinguals having knowledge of two morphosyntactic systems. As a result, bilinguals may possess greater flexibility from switching between morphosyntactic systems. Therefore, bilinguals may utilize this morphosyntactic adaptability when learning the non-linguistic system, possibly affecting their performance.

340 12:30 pm

ERP Effects of Orthographic Neighborhood in a Picture Typing Task

Teresa Roquet, Speech Language and Hearing Sciences (U)

Neighborhood density is a measure of how similar a target word is to other words. High-density neighborhood words (e.g., cake) look like many other words (e.g., take, rake), whereas low-density neighborhood words (e.g., yacht) do not. Across multiple studies of visual word recognition, words from high-density neighborhoods elicit larger amplitude N400s than words from low-density neighborhoods. The N400 is a negative peak in the event-related potential (ERP) waveform that occurs about 400ms after a word is presented. The fact that N400 amplitude is sensitive to neighborhood density suggests that neighbors are automatically co-activated during word recognition. In this study, we asked whether or not neighbors are also co-activated during word production. Participants typed the names of pictures shown on a screen. Half of the picture names belonged to high-density neighborhoods and half belonged to low-density neighborhoods. Preliminary results suggest that pictures with high-density neighborhood names elicit larger N400s than pictures with low-density neighborhood names. These findings suggest that neighborhood density plays a similar role in word production as in word recognition.

341 12:30 pm

Understanding Variability in Executive Function Skill in Toddlers Kelly Kortright, Psychology (U)

Children's executive function (EF) abilities predict academic outcomes and there has been interest in understanding potential sources of variability. Further, recent studies suggest that bilinguals may outperform their monolingual peers on measures of EF. The first aim of this study is to examine the role of Socioeconomic Status (SES) and maternal input on EF. The second aim is to ask whether bilingual children's cross-language processing predicts EF performance.

Forty-six monolinguals and bilinguals (M age = 24;22, range = 22;27 - 27;18) were tested on EF skills measuring local (Stroop task) and global inhibition (Gift delay). Adult language input,

child vocalizations, and conversational turns were recorded during a free-play session. Lastly, a modified Intermodal Preferential Looking Paradigm assessed cross-language word processing on priming task. Children were presented target and distractor image pairs across two conditions: the image pairs were preceded by a word semantically Unrelated or Related to the target.

We first asked whether SES and dual language exposure predicted children's performance on the EF tasks. A hierarchical regression evaluated the effect of language group (bilingual or monolingual) in step 1 and SES (maternal education and income) on step 2 on children's EF performance across tasks. Results revealed a significant effect of SES (F(1, 42)=3.11, p=.036), but no effect of language group.

We next investigated the influence of language on EF skills. A hierarchical regression evaluated EF performance across tasks as the dependent variable and adult words, child vocalizations, and conversational turns entered in steps 1, 2, and 3, respectively. There were no significant language predictors (all n.s. p's >.57).

Lastly, we examined whether bilinguals' cross-language processing on the IPL task differed as a function of EF performance. A T-test revealed no significant difference in cross-language processing (Proportion Looks to the Target) between children in the high and low EF performance groups (p=.24).

These preliminary results indicate that the amount of parental language input, child vocalizations, and bilingual cross-language processing ability are not predictive of children's performance on a subset of EF skills. Nevertheless, children's SES level was a significant source of variability for children's EF ability.

342 12:30 pm

The Influence of College Major on Emotional Intelligence

Hannah Scheierman, Psychology (U)

Emotional intelligence (EI), the capacity to be aware of, control, and express one's emotions, and to handle interpersonal relationships judiciously and empathetically, has evolved from a scientific construct to a particularly popular area of study both in research and clinical psychology. Some authors have claimed that EI can predict work, school, and relationship success. Additional research found that there was a significant difference in El of an experimental group who received EI training compared to a control group who received no training. El training can significantly enhance a person's level of awareness in themselves and others around them. Psychology undergraduate students learn the basics of psychological processes in regards to personality, relationships, and emotional judgments. These findings suggest that people studying psychology specifically may have a higher El than people of other majors. The purpose of this study is to compare the differences of EI in college students and their corresponding majors. The researchers sent out a survey to current college undergraduate students with a series of demographic questions and 33-items of emotional intelligence adapted from Schutte et al. (1998). The sample included 211 current undergraduate students in different majors. Although the mean scores of El in Psychology students were overall higher than students of other majors, there was no significant difference in Psychology students' El and that of students from other majors. However, there was a significant difference in El when comparing gender. Specifically female participants had a higher El score than male. In addition, for practical implications, an individual with a higher El score could result in a better fit for jobs that require selling/marketing, management, social work and psychology based jobs.

Session C11

Poster Presentation: Engineering & Computer Sciences P4 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

343 12:30 pm

Convert any car into a Smart Driverless Car Shivam Garg, Electrical Engineering (M)

Hoping to snooze, have to prepare for the next hour meeting, or want to catch up on reading while your car takes you to the place; who doesn't want it?

In future, driverless cars are going to have superhuman-like capability to recognize the world around them. Several top-notch companies, such as Google, Tesla, CISCO, Uber etc. have heavily invested in related researches. The end product of these research efforts is going to be a unique combination of impeccable hardware and complex software – a smart driverless car. But what's the catch? Not only these cars will be expensive, switching to the upgraded hardware designs which will come with time will make you think a thousand times.

We propose a software centric approach where we can improve car controls by clever code design and implementation. In this project, a high resolution camera is mounted on the car to detect obstacles of any size or color. A tiny device (microcontroller) computes obstacle's precise distance from the car and directs motor's motion accordingly. Our system has fewer components than commercially available driverless vehicles, which reduces cost, provides efficient power consumption and increases system's reliability. Furthermore, as technology improves, the car's software can be upgraded automatically easily without any direct/manual intervention.

We converted our sample car into a smart intelligent machine in approximately \$100. The software we use is completely open source. We achieve more than 98% system reliability. Almost all related projects in this area, paint their car and the road in one particular shade and they never use multi-lane road. Whereas our project doesn't restrict itself on any particular color and it actually, upon realizing other lane's availability, switches the lane.

Business Insider, a leading American news website company, expects 381 million smart cars to be on the road by 2020. The expected revenue generated by them is \$8.1 trillion. Make sure you choose your car wisely. Do come and watch the live demo of our smart car during the poster session.

344 12:30 pm

Vehicular Communication System Preetham Rajkumar, Electrical Engineering (M)

Extensive research and tests on autonomous cars have made it possible to have them on the road in the upcoming years. The major reason for this disruptive trend is the potential opportunity to eliminate human errors and miscalculations using the technology. However, there have been several debates regarding the safety of these driverless cars considering potential accidents.

Current technology in this domain enables cars to detect the surroundings using one or a combination of inputs from odometry, GPS, lidar, computer vision and other techniques. These technologies consistently monitor and process data on a real-time basis, with the sole objective of maneuvering around obstacles and avoiding crashes. This method, though effective on most occasions, fails to completely avoid the possibility of crashes. Current research in car safety has prompted work in V2V (Vehicle to Vehicle) communication, where every car will broadcast its location to other vehicles in its vicinity.

Our study suggests that autonomous car technology along with V2V communication may provide a fail-proof system. The core of the proposed system consists of a 1.2 GHz ARMv8 processor with a real-time operating system; to make sure the systems satisfy the time critical functions (deadlines).

In our system design, we employ NRF24L01 module for the communication channel. It enables data to be exchanged between the two vehicles .The communication system is based on a broadcast type signal. The broadcast signal comprises of critical and time-sensitive information. These signals are transmitted in the case of an accident or any obstacle present in the path. These signals are picked up by any oncoming vehicle heading towards the corresponding vehicle (transmitting vehicle).

Along with the communication setup, we implement an object sensing functionality. This is enabled by the HC SR04 (ultrasonic sensor). The vehicle constantly screens its path for any obstacles. In case of any obstruction to its path, it halts/ slows down to automatically deviate away from the obstacle. It transmits an alert signal only when the obstacle is unavoidable or collision is imminent. With a combination of odometry and communication, we can potentially reduce the fatalities of autonomous driving to a bare minimum.

345 12:30 pm

Analysing Kernel-Level and User-Level Code Performance in OS for Efficient IoT Implementation Chinmay Prabhudesai, Electrical Engineering (M)

Internet of Things (IoT) has allowed a lot of systems to self-evolve over time, and it has changed their control systems fundamentally by enabling smarter mechanisms for even the smallest device. These devices form highly time-critical complex ecosystems, which usually includes a centralized controller. For example, in a plasma chamber, there are various sensors calibrated for stability, but temperature may change drastically from a few hundred to thousands of Kelvin degrees and changes in pressure may occur similarly in a split-second which may be beyond the threshold of the chamber to withstand. Potential sensor reading delays may lead to a delay in control decision leading to a catastrophic event.

Our project targets to analyze the timing performance of IoT applications and shows that they can benefit from smart software implementations. Our comparison is mainly between software implementations made in User and Kernel (Protected) Level. User-level software does not have direct access to hardware and has limited memory, while kernel has the direct hardware access and no restriction on memory. As there is no direct hardware access, user-space code must initiate a system call to read the data from sensor, which requires additional delay. In time-critical systems where decision must be made in a few microseconds, even an infinitesimal amount of additional time can make a huge difference. To reduce the latency of a sample IoT application, we develop a kernel-level code with direct hardware access and no system call requirement. In our system, the values of temperature and pressure sensors should be read very quickly and the corresponding action should be taken instantly.

We compare the user-space and kernel-space implementations of the same application based on total time required to scan all the sensors. Our results show that the kernel-space implementation has 10% better performance than user-space version of the same application. Although this improvement in performance seems to be small, it has a linear impact on performance as number of sensors go on increasing.

346 12:30 pm

Design of Four Elements MIMO Antenna for Tablet Size Ground Plane with Reconfigurable Lower Band and Consistent High Band

Anthony Wang, Electrical Engineering (M)

First, a 3G/4G (704 MHz to 960 MHz) compact printed planar inverted-F antenna (PIFA) with reconfigure lower bands by employing four PIN diode switches is presented on a tablet size ground plane, which also maintains consistent higher communication bands between 1710MHz – 2690MHz. Next, this proposed antenna is implemented as four elements multiple input multiple output (MIMO) antenna on the tablet size ground plane. The presented tablet antenna shows acceptable performance for single radiating element, 2x2 MIMO antenna, and 4x4 MIMO antenna arrangements. Each stage in the lower reconfigure bands and consistent higher bands offer nearly Omni-directional radiation patterns, and total antenna efficiency more than 50%. MIMO parameters such as isolation, envelope correlation coefficient (ECC), total active reflection coefficient (TARC), capacity loss, and mean effective gain (MEG) are also presented. Overall, this antenna offers acceptable MIMO antenna performance parameters for a tablet size ground plane.

347 12:30 pm

A Dual Polarization Massive MIMO Panel Array Antennas at 2.4 GHz with Beamforming Capability Sandhya Krishna, Electrical Engineering (M)

In this presentation, we are presenting a dual polarization massive multiple input multiple output (MIMO) panel array antennas with beam steering capability. This design includes a 2.4GHz, 4x8 microstrip patch planar array with good isolation between the polarizations which is a desired parameter for massive MIMO antenna systems. We are controlling input excitations and phases of the individual radiating elements in an array, to generate adaptive beam forming characteristics, which includes variable gain radiation patterns and beam steering performance. This can be implemented using digital beam forming (DBF) technique.The 2x4 array has been fabricated and its performance is being measured. Important results will be presented during the symposium.

348 12:30 pm

W-Band Feed Horn with Polarizer Structure for an Offset Reflector Antenna for CubeSat Applications Ghanshyam Mishra, Electrical and Computer Engineering (D)

A compact W-band cylindrical waveguide horn antenna with polarizer structure is designed which offers wideband left-hand circular polarization (LHCP) and symmetric radiation pattern. It has wideband impedance matching below S11= -15 dB and axial ratio below 1.8 dB from 79.5 GHz to 87.5 GHz. This horn is used as a feed source for an offset parabolic reflector. The reflector antenna provides peak RHCP (right-hand circular polarization) directivity of 37.3 dBic at 86 GHz.

Session C12

Poster Presentation: Physical & Mathematical P3 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

349 12:30 pm

Measuring Metal Complexation Capacity of Unknown Fulvic Acid Substances via Capillary Electrophoresis Rebecca Townsley, Chemistry (U)

MPXA, an agricultural product derived from lignite (soft coal), is used to complex and deliver various metals to plants. MPXA is principally composed of fulvic and humic substances which allow for the complexation of metals, making them more readily available to plants. This provides an effective alternative to traditional chelators, such as EDTA, and has been shown to promote plant growth with the use of much less product and metal. Optimization of the MPXA to metal ratio is necessary in order to maximize efficacy and economy of this agricultural product. To this end, we need to know the extent to which MPXA complexes the important plant micronutrient metals.

Capillary electrophoresis (CE) is a tool used for separating aqueous phase ions, and as such can be applied to the analysis of MPXA. In aqueous solutions, the MPXA will deprotonate, becoming anionic and having a specific electrophoretic mobility in the CE separation. Uniquely among separation methods, CE is incapable of separating polymers of different sizes. This results in MPXA migrating in a single peak during the separation in the absence of any metals. When the MPXA binds a metal ion, it reduces the anionic charge of the complex, decreasing the electrophoretic mobility of the whole. This leads to an increased migration time of the complex, resulting in peaks of MPXA with and without the metal. Quantifying the differences between the two peaks, as we increase the amount of metal mixed with MPXA, allows us to evaluate the extent of complexation.

We have taken two complementary approaches to analyzing the MPXA complexes. One method employs capillary zone electrophoresis, using a cationic surfactant called didodecyldimethylammonium bromide (DDAB) to coat the capillary. The other method makes use of another cationic surfactant called cetyltrimethylammonium bromide (CTAB) in a micellar electrokinetic chromatography separation mode. Results from both methods are compared and will be presented for the evaluation of the complexation of several important micronutrient metals with MPXA.

350 12:30 pm

Advancing Blood Doping Detection Jessica Torres, Chemistry (U)

The use of performance-enhancing drugs is not uncommon amongst athletes. The use of blood transfusions as a doping method is employed by endurance athletes and one that has been proven difficult to detect. The key challenge is autologous blood transfusions, wherein the donor of the blood cells is also the recipient of the transfused cells. The transfused blood cells are biochemically identical to those in the recipient thus defeating current transfusion testing methods.

We are employing capillary electrophoresis (CE) to exploit differences in the size and electrophoretic mobility of red blood cells (RBC) to identify autologous blood transfusions. In the process of storing the RBCs, they are unchanged chemically but physically they are reduced in size. Our prior work has shown that these changes result in slight differences in the electrophoretic mobility of fresh and transfused cells. The aim of this project is to further differentiate the electrophoretic mobility between the fresh and transfused cells to more clearly identify doping. Polyhexamethylene biguanide (PHMB) is a highly cationic molecule in antibacterial solutions and has been shown to preferentially bind to aged cells. We are investigating how incubation with PHMB can further differentiate the electrophoretic mobilities of the fresh and transfused cells to improve the accuracy of our anti-doping test.

351 12:30 pm

Pptimization of spectrometric analysis of doping in commercial nutritional supplements through liquid phase extraction Adam Perez, Chemistry (U)

This work aims to develop a simple and rapid method for steroid detection in protein powders. With the increasing variety of nutritional supplement protein powders that are sold, athletes may benefit from a convenient process that they can use to detect steroid contaminants in their supplements. This is because the nutritional and legal regulation of dietary supplements is significantly less than for other food or drug products, and manufactures may not be listing all ingredients contained in their supplements. The danger in this is that the inadvertent consumption of steroids by an athlete is treated the same as the voluntary use of drug by the world Anti-Doping Agency. In addition, there are the obvious health risks involved with the consumption of any steroid.

Currently, there are no available testing kits for detecting steroids within protein powders. Our approach to this problem is to use chloroform to extract the steroids from the protein powder, taking advantage of the hydrophobic character of steroids. Quantification of the steroids is achieved by the addition of immiscible perchloric acid to the chloroform, resulting in a selective color change reaction within the chloroform. Although the mechanism for the reaction is unknown, the results are selective colors dependent on the specific steroid present in the chloroform. This work presents our optimization of steroid extraction efficiency, quantification, and viability testing of the project.

352 12:30 pm

The Characterization of the Receptor Tyrosine Kinase Tie2

Madison Kennedy, Biochemistry (U)

Nearly one-third of human kinases are implicated in disease, and this enzyme class has proved to be an enormously successful drug target for combating many diseases. Kinases are key regulators in signaling pathways responsible for such processes as growth, proliferation, and angiogenesis, Tie2/ TEK is an endothelium-specific receptor tyrosine kinase (RTK) responsible for angiogenesis and vasculature maintenance. Mutations in this enzyme can cause venous malformations for which no current therapies are available, and Tie2 has been proposed to be a target for anticancer therapies. However, the molecular mechanisms of Tie2 activity are not well understood. In this work, we will develop robust purification strategy using heterologous expression in insect cells. Autophosphorylation assays will be used to establish catalytic rates of wild-type and mutant Tie2. We hypothesize that mutant Tie2 will have faster rates of autophosphorylation, likely through stabilization of the active conformation of the protein. These studies in kinase activity can improve our understanding of the catalytic features of wild-type and mutant Tie2, and can inform the development of therapeutic targets for vascular disease.

353 12:30 pm

Establishing structure-function relationships of isocitrate dehydrogenase 1 (IDH1) mutations identified in cancer

Stacy Anselmo, Chemistry, Emphasis in Biochemistry (U)

The prevalence of brain tumors in America has reached a staggering 700,000 cases, and is the third most common cancer among adolescents and young adults. Mutations in isocitrate dehydrogenase 1 (IDH1) are found in >80% of grade II/III gliomas and glioblastomas. This enzyme catalyzes the reversible oxidative decarboxylation of isocitrate (ICT) to α -ketoglutarate (α KG), an important metabolite and cosubstrate, but IDH1 mutants are severely deficient in catalyzing this reaction. However, many mutations also gain a function, catalyzing the NADPH-dependent conversion of α KG to 2-hydroxyglutarate (2HG), which can competitively inhibit α KG-dependent enzymes such as DNA and histone demethylases. We have identified a population of IDH1

mutations found in tumors that show a wide range in catalytic efficiency in 2HG production. This allows us to probe the structure/function features of IDH1 mutations solely deficient in the normal reaction relative to those mutations that can also generate 2HG. We show in steady-state kinetic analysis that IDH1 mutants R132H, R132C, A134D and R100Q vary up to 100-fold in catalytic efficiency of 2HG production, and we will use X-ray crystallography to determine the molecular mechanism of this variation in rate. These structure-function relationships can serve as a tool for developing targeted therapies against cancer.

354 12:30 pm

Kinetic Characterization of Isocitrate Dehydrogenase 1(IDH1) Mutations Identified in Tumors

Precious Moman, Biology (U)

Isocitrate dehydrogenase 1 (IDH1) is a key metabolic enzyme mutated in more than 80% of grade II and III gliomas and secondary glioblastomas, most commonly at residue 132. IDH1 is responsible for the NADP⁺-dependent reversible oxidation of isocitrate (ICT) to α -ketoglutarate (α KG) in the cytosol and peroxisomes in mammals, providing critical metabolites and reductive potential. Many of these mutations generate new activity of a NADPH-dependent reduction of α KG to 2-hydroxyglutarate (2HG), resulting in severely deficient production of α KG and NADPH. 2HG is a proposed oncometabolite, however there is limited understanding of the molecular mechanisms that facilitate 2HG production. Kinetic characterization of IDH1 mutations can provide insight into the role mutations play in affecting enzymatic function.

We used steady-state kinetics to measure the catalytic efficiency of 2HG production, and found that mutations varied as much as ~1,000-fold in rates. We then designed a series of IDH1 enzymes with point mutations at residue 132 with a wide range of side chain size and relative hydrophobicity. We show that more polar residues support the normal reaction of ICT to α KG, and more hydrophobic and smaller residues are driving the neomorphic reaction of α KG to 2HG. Studying the catalytic features of IDH1 mutations facilitate our understanding of the features of mutations present in cancer patients with lower grade gliomas and secondary glioblastomas.

Session C13

Poster Presentation: Behavioral & Social Sciences P7 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

355 12:30 pm

Factors Influencing Pregnancy Intentions and Contraceptive Use Among Adolescent Girls in an Diego County: A Qualitative Exploration Sara Kidman, Health Science-Public Health (U)

Background: Adolescent motherhood increases neonatal health risks, including prematurity and low birth weight. Hispanics are disproportionately represented among adolescent mothers, and 57% of US Hispanic adolescent births occur at the US-Mexico border However, little is known regarding girls' perceptions of adolescent pregnancy and contraceptive use among adolescent girls in this border region.

Objective: This study examines factors that influence adolescent girls' perceptions of the costs and benefits of adolescent pregnancy and contraceptive use in the context of the US-Mexico border.

Methods: Sexually active adolescent girls between the ages 15-19 were recruited from a health clinic in San Diego County near the US-Mexico border. Participants (n=137) were invited to complete a survey that explored pregnancy intentions, sexual health, and relationships with male partners. A subset of participants (n=23) were invited to complete interviews which contained questions on types of contraceptives used, discussions with parents about sex, and discussions with male partners about contraceptives and pregnancy. Descriptive statistics (e.g., frequencies, means) were generated for survey variables and Atlas Ti was used to identify themes related to pregnancy intentions and contraception in the qualitative interviews.

Results: Survey participants were majority Latina (76%), and 50% were in a relationship. Condoms were reported most frequently as the form of contraception used in the past three months (46%); 37% used long term contraception (e.g. implant, IUD, or Depo shot); 16% used Plan B; 5% used withdrawal, and 12% didn't use any contraception. Interview participants reported wanting to delay pregnancy in order to achieve their educational, financial, and career goals. Emergent themes highlighted the following barriers to delayed pregnancy: 1) parents' not wanting their adolescent girls to use contraceptives 2) girls' intimate partners wanting them to become pregnant and 3) inconsistent contraceptive use.

Conclusion: The current study highlights that most adolescent girls from this population wish to avoid pregnancy, but many do not engage in effective contraceptive use, due at least in part to pressures from parents and partners. Findings suggest that interventions to prevent adolescent pregnancy may need to address these barriers interfering with girls' control over pregnancy timing.

356 12:30 pm

Perceptions of Black Women due to their Hairstyles and Textures Ashley Zollicoffer, Psychology (U)

In the United States, an importance has been placed on women to continuously encompass themselves in the notions of beauty. Much research has been done in this area but majority of the research pertains to Western ideals of beauty, which is a set standard usually for blonde. White women. By exploring this topic, we must address how this affects other racial groups such as Black women who are often subjected to follow this norm. In order to understand how this custom of altering one's appearance prevails within the Black community, we must examine the perceptions of Black women when they do choose to present themselves with more African features compared to when they present themselves in a manner appealing to White aesthetics. Specifically speaking, this research will examine the perceptions people have of Black women who wear natural hair compared to weaves, wigs, or extensions. To conduct this research, a survey was administered that presented two pictures of Black women with a particular hairstyle and ten questions that assessed the morals, attractiveness, and professional and academic success of those individuals. The participant's responses were recorded on a Likert scale ranging from very likely to very unlikely. It is hypothesized that the individuals with natural hairstyles will be seen as more militant than individuals with altered hairstyles. Another expected finding is that the individuals with altered hairstyles will be viewed as more attractive, more successful, and more likely to make moral decisions. By identifying perceptions that can potentially lead to a negative impact on the Black community, the hope is to reduce current stigmas and stereotypes in place to restrain certain demographic groups and allow people to express beauty as they deem appropriate for themselves.

357 12:30 pm

Racial- Gendered Policing Angelica Tharpe, Pre Psychology (U)

Research has found that physical characteristics that are related to specific minority groups may play a major role in the way that law enforcement police these individuals. In this study, investigators will be analyzing racial- gendered policing in regards to how often a specific group of women are approached by law enforcement. Therefore, investigators want to know how often women in San Diego encounter unwanted law enforcement interactions. Investigators hypothesize that Black or African American women in college are less likely to encounter law enforcement versus Black or African American women who are not in college. Investigators also want to test if Black or African American women are more likely to encounter law enforcement based on race and gender versus non-African American women.

358 12:30 pm

The Physiological Distress of Widowed Men Arely Sanchez, Sociology (M)

Abstract: For individuals to express masculinity they need to follow certain gender norms and expectations. Due to gender norms related to emotional expression, males tend to bottle up their emotions even in dreadful or life changing situations. This can lead to a negative impact on men when they face the difficulties that can be associated with being widowed. Therefore it is interesting to analyze widowed men and how they maintain their health after their life has changed by losing their spouse/partner. This research paper analyzes the psychological distress of widowed men measured using the Kessler Six Scale, and examines the life factors of race/ethnicity, income status, age, education, and employment status. Using data from the IHIS (Integrated Health Interview Series), a regression analysis of Ordinary Least Squares (OLS) shows that race/ethnicity, age, and employment status have a statistically significant effect on windowed men's psychological distress. While other life factors such as education and income status are less significantly affecting widowed men's psychological distress. The results of this study suggests that widowed men's psychological distress does depend on certain life factors.

359 12:30 pm

Experiences of Cultural Brokering in Latino Young Adults Stephanie Nguyen, Child Development (M)

In the past few decades, there has been an increase in the rates of immigrant families in the United States, especially families from Latin American countries. Many Latino families migrate in search of a better life and opportunities for themselves and their children. According to the U.S. Census Bureau (2014), the Latino population consists of 55 million, which represents 17% of the total U.S. population. The U.S. Census Bureau projects that the Latino population will increase 57% from 2015 to 2050. With the growing rates of immigrant families in the US, researchers and mental health practitioners must be aware of potential stressors within this group. Immigrant children often become familiar with the mainstream culture and language much guicker than their parents, which allows immigrant youth to serve as cultural brokers. Cultural brokering is the work that immigrant youth do to help their parents navigate the mainstream culture (Trickett & Jones, 2007). Previous research has found that cultural brokering can have positive and negative effects on the mental health and well-being of immigrant youth (Love & Buriel, 2007; Weisskirch & Alva, 2002). However, much less is known about cultural brokering experiences of non-immigrant Latino youth and how this may influence their overall well-being. The purpose of this study is to examine patterns of cultural brokering among immigrant and non-immigrant youth and its impact on their psychological well-being. More specifically, the study focuses on analyzing both immigrant and non-immigrant young adults' levels of

general self-efficacy and depressive mood in relation to cultural brokering. We are currently collecting quantitative data from 300 nonimmigrant and immigrant youth from a southern California university through an online survey. The preliminary findings indicate that the majority of our participants have brokered for their parents in the past. This work seems to occur in casual, low-stakes places, such as in restaurants. The results related to the effects of brokering on psychological well-being of immigrant youth are mixed. These findings indicate the need to understand the unique stressors that Latino families face.

360 12:30 pm

Gender Differences in the Provision of Injection Initiation Assistance Among People Who Inject Drugs in Tijuana, Mexico Stephanie Meyers, Interdisciplinary Research on Substance Use (D)

Background: Persons who inject drugs (PWID) play a key role in initiating others into injection drug use. Further, scientific evidence to date demonstrates that gender may impact the intensity of a range of injection-related health and social harms. We therefore sought to determine whether gender also impacted the risk that PWID provide injection initiation assistance to others in Tijuana, Mexico, a setting disproportionately impacted by injection-driven HIV transmission.

Method: Data from PWID recruited into the Proyecto El Cuete IV cohort in Tijuana, Mexico were analyzed as part of the PReventing Injecting by Modifying Existing Responses (PRIMER) study. All participants underwent quantitative interviews assessing a range of socio-demographic (i.e., gender, age, living situation, and income) factors as well as participant report of having ever initiated others into drug injecting, which was defined as the dependent variable. Logistic regression analyses were employed to assess the relationship between gender and the dependent variable while adjusting for potential confounders.

Results: In total, 531 participants provided data, among whom 326 (61.39%) are female, and 75 (14.12%) reported ever initiating others into injecting. In a final fitted logistic regression model, female gender was negatively associated with ever initiating others into injection drug use (Adjusted Odds Ratio [AOR] = 0.45, 95% Confidence Interval [CI]: 0.25, 0.79, p < 0.01), as was past 6 month methamphetamine use (AOR = 1.95, 95% CI: 1.17, 3.25, p = 0.01), and past 6 month cocaine use (AOR = 6.85, 95% CI: 1.73, 27.17, p < 0.01).

Discussion: Being male and a stimulant (i.e. methamphetamine or cocaine) user was significantly associated with a history of ever providing injection initiation assistance to others. These findings have implications for the development of tailored interventions and harm reduction services geared towards reducing the expansion of epidemics of injection-driven HIV transmission in high-risk settings characterized by frequent initiation into drug injecting among vulnerable populations.

Session C14

Poster Presentation: Biological & Agricultural Sciences P4 Friday, March 3, 2017,12:30 pm Location: Montezuma Hall

361 12:30 pm

Cis-regulatory Analysis of the Ascidian Pou4 Gene Tiffany Hoang, Biology (U)

Cis-regulatory elements are sequences of non-coding DNA that control the temporal and spatial expression of a gene. These elements contain clusters of binding sites for transcription factors that activate or repress transcription. Cis-regulatory elements can be found upstream of a transcriptional start site, downstream of a gene, and within the introns of a gene. The comparative genomics program VISTA highlights areas of evolutionary conservation between sequences. Conserved non-coding sequences often correspond to cis-regulatory elements. The Pou4 gene of the ascidian Ciona robusta regulates the differentiation of epidermal ciliated sensory neurons (ESNs) of the larval tail and palps. During development, Pou4 expression initiates at the embryonic tail-tip, proceeding anteriorly through the dorsal and ventral midlines at the future site of each ESN, and VISTA analysis has highlighted several clusters of putative regulatory elements. By understanding which sequences are responsible for each characteristic of expression, we can begin to understand how this gene is regulated.

Here we describe the experiments in which a series of fluorescent reporter transgenes containing different putative Pou4 regulatory elements have been constructed and then electroporated into fertilized ascidian eggs. As the embryos develop, the particular elements found in each transgene direct expression of a fluorescent protein in accordance with the spatial or temporal regulatory role that element has during normal development. In preliminary experiments, a transgene containing a 1.8kb region upstream of the Pou4 gene was only expressed in ectopic mesenchyme cells. This result suggests that the sequence lacks important features that prevent Pou4 from being expressed in the mesenchyme. A second transgene that adds the sequence found in the Pou4 first intron is expressed in the mesenchyme and in the embryonic midlines, highlighting the importance of that intronic element to correct Pou4 regulation. By constructing an array of similar transgenes we should be able to discern what pieces of the gene are responsible for its dynamic spatial and temporal expression pattern.

362 12:30 pm

Molecular Evolution and Expression of Defense Genes Underlying Plant Carnivory Zachary Johnston, Biology (U)

Carnivorous plants are typically found in sandy, nutrient poor environments. Plant carnivory is one adaptation to obtain essential nutrients from such an environment. The process is determined in part by suites of enzymes associated with morphologically diverse trapping mechanisms derived from modified leaves. Interestingly, the majority of secreted enzymes (e.g., chitinases, glucanases, ribonucleases) show strong structural and/or functional homology to a group of common plant defense proteins known as pathogenesis-related (PR) proteins. Previous studies have demonstrated that the application of nitrogenous substrates to these glands induces enzyme activity, however, the origin, evolution, and expression patterns of the corresponding genes have been studied in little detail. Using the Cape sundew (Drosera capensis L.) as a model system for understanding the genetic basis and regulation of plant carnivory, we combine targeted nitrogen treatments to study PR gene expression with phylogeny. Our research highly benefits from the availability of two newly generated nuclear carnivorous plant genomes for the order Caryophyllales (Drosera capensis and D. regia), and the recent release of genomes for the orders Lamiales and Oxalidales (Cephalotus follicularis and Utricularia gibba).

363 12:30 pm

Analyzing the effect of crAssphage sequences on the FOCUS profiling output

Emma Billings, Biology (U)

A recently described novel bacteriophage, called crAssphage, was discovered when its unknown sequences were detected among the rest of the microbial community's metagenome in the sequence database. Since most of the crAssphage sequences did not match the database sequences, we declared crAssphage as a new virus. FOCUS is a program that provides us with information about the types and abundance of organisms that are found in microbial samples. The goal of this project was to analyze the effect of unknown sequences on the FOCUS output. We expected that the addition of unknown genome sequences of crAssphage to a metagenome sample composed of known sequences would decrease the accuracy and number of matched reads in the FOCUS output.

To analyze the effects that unknown sequences had on the accuracy of the FOCUS output, we generated a metagenome sample composed of random known viral genomes from the microbial database. We added sequences from the crAssphage genome, in increments of 100 reads, to our metagenome sample. With FOCUS, we evaluated the presence and abundance of genera in the original metagenome sample and with each addition of crAssphage sequences. We computed the average percent error comparing our original metagenome reads and with the addition of crAssphage sequences using code written in Python. We also constructed a plot comparing

the relative abundance of unknowns with the average error. Our results showed a positive correlation in the relative abundance of crAssphage sequences and the average error in our metagenome sample. When the largest number of unknowns were added, the average error was the largest. Although the average error was highest when the most unknown sequences were added to our sample, high ranked genera were still present even though the lower ranked genera had disappeared in our FOCUS output results. These results confirmed our hypothesis that the accuracy and number of matched reads in the database decreased in samples with the addition of unknown sequences.

364 12:30 pm

Gap-filling metabolic networks using k-mer distance evidence

Taylor O'Connell, Bioinformatics and Medical Informatics (M)

Genome-scale metabolic models are constructed by inferring the network of metabolic reactions present in an organism from the organism's genome annotations. The models aim to summarize the full metabolic capacity of an organism, however, the inferred reaction networks are nearly always incomplete due to incorrect or missing annotations as well as missing biochemical and organismal knowledge. Missing reactions, known as gaps, that exist in the draft network must be filled by adding reactions to the model in order to complete the network so the model may be used to simulate cell growth. The most common methods for gap-filling are parsimony based, adding only the minimal set of reactions needed to complete the network and enable growth in silico. This type of approach fails to take into account evidence from the organism's genome and is not guaranteed to produce gap-filling solutions consistent with the organism's metabolic phenotype.

The aim of this research project is to develop a gap-filling approach based on linear programming optimization that incorporates k-mer distance evidence in order to produce more accurate gap-filling solutions. A random forest model will be trained to classify proteins into their functional roles using k-mer distances calculated at different values of k as features in order to identify the most informative k-mer distance metric. Reactions missing from the draft model will be proposed by identifying those reactions that are present in close genomes, connect to metabolites already present in the network, or are missing from SEED subsystems. K-mer distances will be calculated between proteins present in the genome of interest and a database of known proteins with functionality associated with the missing reactions. The k-mer distances will be used to assess probabilities for the missing reactions which will then be used in a weighted linear programming formulation in which the objective is to minimize the flux through unsupported reactions while maintaining biomass production above the threshold required for growth. This will allow the determination of which reactions must be added to the network while avoiding the issue of adding spurious reactions with little evidence for existing in the model.

365 12:30 pm

Characterizing Metagenomes Using K-mer Abundance

Beverly Hom, Bioinformatics and Medical Informatics (M)

Analysis of metagenomic data allows further understanding of samples that contain abundant and diverse microbial communities which can be characterized using assembly methods. A fundamental and challenging step in understanding microbes, is in reconstructing multiple genomes from mixed sequence reads. Metagenomic data is often error-prone with sequence repeats or gaps, making it difficult to accurately reconstruct individual genomes from different species.

Tools for genome assembly use short sequences of length k for efficient counting. Currently, we lack tools that can graphically estimate and determine a k value for metagenomic data containing multiple genomes. A new approach involves graphing the distribution of k-mer abundances then using a bloom filter data structure to compute an accurate k value for assembly. The goal is to use a k-mer counting algorithm, graph the distribution of k-mer abundance, use machine learning approaches to segregate genomes based on k-mer counts, and compute the best k value to re- assemble multiple genomes from a set of sequences.

366 12:30 pm

Metabolic model and data-driven exploration linking genotypes to phenotypes Daniel Cuevas, Computational Science (D)

Current bioinformatics trends show a shift toward understanding an organism as a functional, metabolic entity rather than only through the lens of its genetic landscape. However, due to the complexity of individual data sets that describe genome annotations and phenotypic results it is often difficult to evaluate an organism in the context of its genome with its metabolism. Functional genomic studies are supplemented by in silico genome-scale metabolic models to explore the metabolism of an organism using Flux-Balance Analysis (FBA). Based on the organism's metabolic-associated genes, these models allow the exploration of metabolic flux through an entire metabolic network. PyFBA, an extensible Python-based open-source software package (http://linsalrob.github.io/PyFBA), provides the platform to reconstruct the metabolic map, perform FBA on several media conditions, and refine the metabolism through network gap-filling. PyFBA enables the novel assessment of phenotypic results in the setting of accurate genome-scale metabolic models.

With our collection of more than fifty diverse bacteria that have been sequenced, annotated, and grown on over 100 minimal media compositions (http://edwards.sdsu.edu/dbbp), we have begun to investigate methods in connecting genotypes to phenotypes. Functional annotations performed on the RAST pipeline are tied to the biochemical reactions contained within the PyFBA metabolic model. Data visualizations of metabolic flux rates are viewed within the perspective of protein functional groups and metabolic pathways. Quantifying genetic composition, growth dynamics, and metabolic phenotypes facilitates microbe-microbe statistics and comparisons. By linking a microbe's genotype to its phenotype, new methods arise to characterize and compare microbes not yet explored by traditional bioinformatics approaches.

Session C15

Poster Presentation: Health Nutrition & Clinical Sciences P4 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

367 12:30 pm

Evidence Based Sports Biomechanics Program Noah Ingram, Kinesiology- Pre Physical Therapy (U)

Purpose: Athletes participating in sports including cutting and jumping movements can be at high risk for lower extremity injury. There is extensive evidence that risk factors for lower extremity injury can be identified during sports-related movements, however this evidence is not commonly translated into practice. Objective measures of lower extremity forces and movement with 3D motion capture can be used to identify the lower extremity risk factors. The purpose of the current project was to develop a standardized, evidence-based program to screen athletes during sport-specific tasks, to identify athletes that are at risk for injury or re-injury, with the goal of informing rehabilitation programs and return-to-sport decisions.

Methods: Division I athletes were evaluated in a 3D motion capture laboratory. Lower extremity forces and movements were measured while the athlete performed four dynamic sport-specific tasks including: single leg squat (SLS), the Y-Balance Test (YBET), drop vertical jump (DVJ), and single leg cross over hop (SLH). Kinematic data of the lower extremities was collected during all tasks, and kinetic data was obtained during DVJ and SLH. The data was analyzed using Visual 3D (C-Motion). Kinematic data were presented in a graphical format, and individual athlete data was interpreted based on risk factors identified from the literature.

Results: Individual athlete data were presented to the team athletic trainer. Common risk factors identified included unequal loading of the lower extremities with DVJ and SLH tasks, and decreased hip flexion and increased knee motion and variability in the axial and frontal planes during SLS, DVJ, and YBET. The information was used to tailor athlete training programs, with the goal of mitigating lower extremity risk factors and preventing lower extremity injury or re-injury.

Conclusion: Quantitative 3D motion capture testing can be used to identify risk factors for lower extremity injury in athletes participating in cutting and jumping sports. Translating the evidence on risk factors into practice can help direct specific training programs with the goal of injury prevention. Future work can determine whether the program has an impact on lower extremity injury rates.
368 12:30 pm

Ethnic differences in pain sensitivity and associations with psychological health Paige Kettenburg, Kinesiology Pre-Physical Therapy (U)

Introduction: The purpose of this study was to investigate ethnic differences in pain sensitivity and its association with psychological health, including pain-related anxiety and acculturation stress. We hypothesized that healthy Hispanics who experienced heighten acculturation stress and higher pain related anxiety would present higher pain sensitivity.

Methods: Participants includes 14 healthy, second-generation Mexican Americans and 14 non-Hispanic Caucasians. The protocol included pain threshold and tolerance testing for mechanical and thermal stimuli applied to the forearm. Additionally, participants were asked to rate either the intensity or unpleasantness of four different levels of stimuli using a 101-point Numerical Pain Rating Scale (NPRS). Pain sensitivity outcomes included pain threshold, pain tolerance, and affective bias quantified as the ratio of unpleasantness and intensity NPRS ratings at each stimulus level. Self-report surveys were also utilized to assess general trait anxiety (STAI-T), pain-related anxiety (PASS-20), and acculturation stress (SAFE).

Results: After matching both groups on demographic characteristics, there were no differences in general or pain-related anxiety. Mechanical and thermal pain thresholds were similar between groups; however, Hispanics had a significantly greater mechanical pain tolerance than Caucasians (p<0.05). For low intensity mechanical stimuli, Hispanics showed reduced affective bias in comparison to Caucasians (p<0.05). Among Hispanics, affective bias was associated with pain-related anxiety (R2=0.29), and mechanical pain tolerance was associated with both generalized anxiety (R2=0.25) and acculturation stress (R2=0.45). Caucasians showed no association between psychosocial stress and pain sensitivity.

Conclusions: Despite similar levels of anxiety, Caucasians responded to painful mechanical stimuli with greater affective responses and reduced tolerance than Hispanics, suggesting that Caucasians experience heightened emotional processing of mechanical pain. There were no differences in sensitivity or affective responses to thermal stimuli in either group. Among Hispanics, greater pain-related anxiety predicted a greater perception of unpleasantness (increased affective response), whereas higher trait anxiety and acculturation stress predicted lower pain tolerance. This suggests that acculturation and environmental stress contribute to individual differences in mechanical pain perception among Hispanics.

369 12:30 pm

Overground Ambulation Using an Exoskeleton with Variable Assistance for Individuals with Incomplete Spinal Cord Injury Carla Baxter, Doctor of Physical Therapy (D)

Statement of Problem and Hypothesis: A significant effect of a spinal cord injury is the loss of functional walking capacity, severely limiting participation in daily activities, decreasing health and quality of life. Recently, wearable bionic exoskeletons, such as the Ekso GT, have been developed for gait rehabilitation. The Ekso has the unique ability to provide variable amounts of assistance during overground ambulation for those with lower extremity weakness, facilitating improved muscle activation during walking by increasing engagement and task specific practice. The purpose of this study was to compare oxygen uptake and muscle activation during walking in the Ekso across different levels of assistance in participants with motor incomplete spinal cord injury (SCI). We hypothesized that minimizing assistance from the Ekso during walking would result in greater oxygen uptake and muscle recruitment.

Methods: Three subjects with incomplete SCI performed three 6 minute walk tests (6MWT) in the Ekso. For the first trial, subjects were in Max mode (the robot moves the legs through a pre-determined trajectory no matter the effort of the user). For the second and third trials, subjects were randomly assigned to Adaptive (the robot decreases the amount of assistance if the user follows the pre-determined walking trajectory) or Fixed mode (the assistance provided by the robot is limited to a set amount). We measured percent of maximal oxygen uptake (%VO2 max) and Rating of Perceived Exertion (RPE) during walking. Electromyography (EMG) was recorded from 6 lower extremity muscles bilaterally.

Results/outcomes: Average %VO2max was higher during Fixed (64.7%) than Adaptive mode (60.7%). RPE for Fixed mode (5.0) was also higher than in Adaptive mode (3.3). During Max mode, %VO2max was 64.33%, but RPE was 1.3. This discrepancy may have been the result of increased spasticity during the Max walking trial. EMG data was variable within and between subjects.

Conclusions: Increasing muscle activity during walking training has several potential benefits for those with incomplete spinal cord injury. Improved activation of leg musculature during overground ambulation training can improve cardiorespiratory fitness and functional walking capacity, as well as improve walking function without the exoskeleton.

370 12:30 pm

The Impact of Hip Strengthening on Pelvic Floor Function: A Novel Rehabilitation Approach Taylor Autry, Doctorate of Physical Therapy (D)

Purpose: Incontinence is a prevalent condition in people worldwide, affecting nearly 26% of women (Pierce et al., 2015). Kegel exercises are a widely accepted exercise treatment for pelvic floor dysfunction (Kissler, 2016), however, it is difficult to ensure proper execution of Kegel exercises, and up to 30% of women are unable to perform Kegels correctly (Kandadai, 2015). Nearby muscles, such as the obturator internus, may help to strengthen the pelvic floor muscles (PFM) due to a fascial attachment to the PFM (Tuttle et al., 2013). The purpose of this study is to determine if strengthening the external rotators of the hip (obturator internus) will improve PFM strength in postmenopausal women.

Subjects: 29 women, mean age of 66 years old (+/-15) were assigned an exercise intervention program for 12 weeks, aimed to strengthen the obturator internus.

Methods: Initial and final examinations of participants were performed by a licensed physical therapist who is trained in pelvic floor assessment. Examinations included valid and reliable questionnaires, a manual pelvic exam, strength testing of the hip external rotators using a hand-held dynamometer, and strength measurements of the PFM using the Peritron perineometer. Participants participated for a 12 week period, including one initial and one final examination, 2 weekly exercise sessions at home, and one weekly exercise session in the presence of a doctor of physical therapy student.

Results: (Results are mean \pm SEM) 25 women completed the study. Average PFM strength increased from 21.47 \pm 2.55 to 29.1 \pm 3.15 cmH2O. Hip external rotation strength increased in the right hip from 12.75 \pm 0.46 to 15.42 \pm 0.63 lbs and in the left hip from 11.43 \pm 0.43 to 15.61 \pm 0.69 lbs PFDI-20 scores decreased from 56.88 \pm 10.76 to 40.62 \pm 10.63 indicating less pelvic floor dysfunction.

Conclusion: The average increase in pelvic floor muscle strength supports the hypothesis that strengthening the external rotator muscles of the hip may lead to increased strength in the muscles of the pelvic floor. This evidence suggests that this may be an alternate method to strengthen the muscles of the pelvic floor and minimize pelvic floor dysfunction.

371 12:30 pm

Postpartum Diastasis Recti Abdominis: Treatment and Functional Implications Jennifer Fasching, Physical Therapy (D)

Purpose: Diastasis Recti Abdominis (DRA) affects 52% of women at eight weeks postpartum, and 39% of women at 6 months postpartum. Evidence suggests DRA may be linked to lumbopelvic and gynecological health problems in this population, though this is still being debated in the literature. Limited research exists describing effective non-invasive treatments for DRA in postpartum women. Exercise targeting transversus abdominis (TRA) has been shown to be effective in reducing inter-recti distance (IRD), but no studies have utilized only taping as an intervention for DRA. The purpose of this pilot study was to determine the most effective non-surgical, non-invasive physical therapy intervention for treating DRA in postpartum women. This study investigated the effect of three interventions (exercise, kinesiotaping, and exercise with kinesiotaping) on IRD compared to a control group. Methods: 30 women (32.03±4.33 years old; number of births=2.30±1.34) were randomly assigned to groups: exercise (n=10), taping

(n=8), exercise with taping (n=5), or control (n=7). All subjects were 6-12 weeks postpartum and had palpable separation of the rectus abdominus muscles. Interventions (exercise and/ or taping) were performed 3 times per week for 12 weeks. The primary outcome was IRD, measured via ultrasound imaging at the umbilicus. Data are presented as means±SD. Results: The exercise with taping group exhibited the most notable decrease in IRD, with an average IRD difference of 1.31cm±0.20. Exercise group IRD decreased by 0.91cm±0.39, and taping group IRD decreased by 0.44cm± 0.40. The control group IRD decreased by 0.23cm±0.60. Conclusions: Our preliminary findings suggest exercise and taping in combination is the most effective treatment for reducing IRD, followed by exercise alone. The key to treating DRA may be the exercise component, since taping and control groups yielded similar small changes in IRD. Our preliminary data suggest exercise targeting the TRA may be an effective treatment to minimize IRD. Further studies that include a larger patient population, particularly those with low back pain and pelvic floor dysfunction, are needed to validate these findings and to establish a standardized treatment protocol for DRA.

372 12:30 pm

Effects of Over Ground Bionic Ambulation Training on Walking Function and Health in People with Incomplete Spinal Cord Injury: A Case Series Rowena Tam, Doctor of Physical Therapy (D)

Statement of problem: Therapeutic interventions that improve mobility after spinal cordinjury can improve quality of life and lessen secondary complications from reduced physical activity. Previous studies have shown benefits of overground bionic ambulation (OBA) for people with complete spinal cord injury (SCI), but there is limited research on the effects of this training for individuals with incomplete SCI.

Purpose/Hypothesis: The purpose of this case series is to explore how OBA training using the Ekso GT, a robotic device that enables overground walking for those with weakness and paralysis, affects walking performance and other aspects of health and function for individuals with motor-incomplete SCI. The Ekso can provide variable assistance so that individuals can use their residual motor function instead of being passively moved through the motions of walking, increasing engagement and task-specific practice. We hypothesized that after training in the Ekso, participants would demonstrate improved gait quality, walking speed, walking distance, balance, bowel function, and pain.

Methods: Four participants with incomplete SCI trained two days per week for twelve weeks in the Ekso with variable assistance, so that assistance from the bionic suit was given only as needed during walking. Training sessions lasted one hour with rest breaks as needed. Participants used a walker for balance support and, if possible, progressed to forearm crutches during the training period. Subjects completed the 10 meter walk test, 6 minute walk test, Activities-specific Balance Confidence (ABC) scale, Berg Balance Scale, Self Reported Functional Measure, Brief Pain Inventory (BPI), Neurogenic Bowel Dysfunction Score and the SCI Functional Ambulation Inventory before and after the training period.

Results: After training, three of four participants showed improvement in balance confidence, while two of four showed improvements in balance function. Bowel function improved and pain decreased in three of four subjects. There were no improvements in walking speed or endurance. Two of four subjects needed less assistance with daily activities, and three of four showed improvements in gait quality.

Conclusions: Overall, OBA using the Ekso with variable assistance could improve aspects of health, function and quality of life for individuals with motor-incomplete SCI.

Session: C16

Poster Presentation: Engineering & Computer Sciences P5 Friday, March 3, 2017, 12:30 pm Location: Montezuma Hall

373 12:30 pm

Deriving field-based streamflow and stream-power in Alvarado Creek in San Diego, California Sheikha Al-Rahbi, Civil Engineering (U)

Hydrological processes are affected by changes in land use such as urban development and can result in alterations in peak discharge, total flow, flooding processes, erosion, channel morphology (channel geometry and roughness), and water quality. To improve urban waterways, there is interest to remove non-native plants along riparian areas to increase channel capacity and enhance water quality. Restoration projects includes re-vegetating native plants such as cottonwood trees, oak trees, blackberry and grape ground covers. This research focuses on a reach of Alvarado Creek, an urban stream within the San Diego River watershed. Extensive efforts to restore this reach occurred in Spring 2016. To understand the hydrologic and geomorphic implications of restoration, field-based sampling and monitoring provides parameters such as streamflow, water quality, grain size distribution, and cross-sectional areas prior and after restoration. Pressure transducers installed between February 2016 to the present provide water depth and temperature continuously every 10 minutes. This information is coupled with field measurements of water levels and discharge estimated through the velocity-area method to develop a rating curve to estimate streamflow. The Wolman sampling method is used to provide the medium substrate size (D50) and maximum diameter (D-max). These variables are used to estimate bed shear stress and stream power, which provides an estimate sediment transport and morphology (channel widening or aggradedation). Results from this study will provide a basis for hydrologic and water quality modeling and prediction tools; providing critical information for water resources, especially in semi-arid and urban regions undergoing drought conditions.

374 12:30 pm

Cell mechanics: how mechanical properties effect malignant transformation and homeostatic pressure in cells Kasia Siedlecki, Mechanical Engineering -Bioengineering Emphasis (U)

Tumor genesis, or malignant transformation, is the process by which healthy cells mutate and develop the characteristics of cancer through uncontrolled cell growth and division. It is well studied that cell malignancy is a result of genetic and epigenetic mutation over time, however, what is less known is the role of the mechanical phenotype of cells and their microenvironments. Characteristically, tumor growth deforms its surrounding environment to accommodate metastasis. Physical forces and processes are being applied; therefore, biochemical properties alone are not sufficient in the study of tumor growth and metastatic potential. Utilizing a 3D discrete model, we are able to model the effect of changes in cell mechanical properties and their effect on tumor growth. Specifically, an increase in cell compliance has shown an increase in metastatic potential and tumor genesis. Further, plateaus in growth show the effect of cell compliance on homeostatic pressure, that is, when mechanical stresses in the tumor and extracellular environment are in equilibrium and tumor growth slows or seizes. These findings suggest that changes in cellular mechanical properties are contiguous with the malignant transformation and homeostatic pressure of cells.

375 12:30 pm

Algal cell disruption using copper ethanolamine to enhance lipid extraction Cintia Chin, Environmental engineering (M)

In this study, the feasibility of using copper ethanolamine complex, commonly known as Cutrine plus, for algae cell disruption was investigated. In algal suspension at 0.16%, ~40% of the cells were dead at 200 mg/L of Cutrine plus as Cu after 48 hours of contact time. SEM morphologies of the cell surfaces also confirmed that the walls of the algae cells were ruptured. This rupturing effect has influenced the lipid recovery yields, increasing it by ~37 and ~66% with respect a control for a 10% algae paste dosed with 100 and 200 mg of Cutrine plus as Cu per g of dray algae, respectively, after 48 hours of contact time. Moreover, the specific energy for Cutrine plus, determined as 0.01 MJ/kg dry algae, is significantly less than that of hydrodynamic cavitation, 33 MJ/kg dry algae, which is the most "efficient" of the existing algae cell disruption methods.

376 12:30 pm

Stochastic Variations in Cellular Mechanical Properties Modeled in Tumor Growth Zibah Mirzakhel, Bioengineering (M)

When healthy cells undergo malignant transformation, they begin to acquire the properties of cancer that contribute to eventual tumor growth and metastasis. While the biochemical properties of cancer cells are vastly studied, less is known about the mechanical properties. Experimental studies have revealed that cancerous cells possess lower stiffness values then their normal counterparts, benefiting their overall ability to proliferate and invade. Furthermore, it is suspected that the quantity of these soft cells and the interactions amongst them contributes positively to tumor progression. To observe this behavior, a three-dimensional discrete cell model will be used to stochastically vary stiffness values between individual cells in the system. Specifically, cells with similar stiffness values will be clustered together to determine whether interactions between soft cells promotes proliferation at higher rates then stiffer cells. It is expected that as stiffness values of cells are lowered within the system, rates of soft cell proliferation will increase. In order to validate the computational model, data will be compared to experimental observations. This phenotypical change can provide insight on tumor growth rate and metastatic potential of cancerous cells. In the future, this evaluation of mechanical characteristics can be applied in a patient-specific approach to determine cancer progression.

377 12:30 pm

Anaerobic digestion of lipid extracted algae Ramin Eskandarzadeh Yazdi, Mechanical and Aerospace (D)

This study investigated the feasibility of using lipid extracted algae as feedstock for the production of methane through anaerobic digestion process. 200 mg of lipid extracted from 1 gram of dry algae which is equivalent to 7.66 KJ/gr of C.vulgaris. A Two-step method of distillation with Rotovap and evaporation at 100 °C was the best method of purification of LEA. Bench scale anaerobic digesters were set up and a number of operational and experimental parameters were examined to establish the optimum condition for the digestion. With LEA to inoculum ratio of 1 to 1, alkalinity of 3000 mg/L, digestion time of 20 days and pH of 7, digesters produced the highest CH4 yield under the mesophilic condition. on average 108.7 mL/gram of LEA or 87 mL per gram of dry algae was produced at 25°C and 1 atm which is equivalent to 3.16 KJ/ gram of C.vulgaris, resulting in a 40% increase in energy recovery from C.vulgaris.

Session C17

Poster Presentation: Behavioral & Social Sciences P8 Friday, March 3, 2017,12:30 pm Location: Montezuma Hall

378 12:30 pm

El Caso de los Desechables: Hacia la Transformación Socio-jurídica del migrante (The disposables ones: the path to socio-legal transformation for irregular migrants) Derick Abrigu, Latin American Studies/ Public Administration (M)

My purpose is one of empowerment; creating mechanisms by which migrants caught in transitory spaces can achieve positive socio-legal transformation. Described through the lens of three vulnerable migrant populations trapped within the political nexus of the U.S.-Mexico border region, this exploratory research recreates the very hostile setting of the current sociopolitical landscape and exposes the imminent necessity to re-conceptualize the traditional role that NGO and state-level agencies play in determining the political, social, and legal fate of irregular migrants. This rich description, stemming from three case studies that conducted research with repatriated Mexican citizens, undocumented Central American migrants, and a diasporic Haitian community, challenges the contemporary immigration policy structure and questions its strong dependency on the state. In its place, this investigation proposes the alternative construct of forums involving multiple actors that - fundamental to the long-term sustainability of a migrant's well-being – lends credibility to the voices and experiences of these transitory populations. Functioning within the various NGO shelters located along the border region, the unmistakable characteristic of human agency present in this structure fosters social consciousness and accountability and leads to a stronger societal recognition; a factor which in turn, lays the foundation of a progressive social integration mechanism, and promotes a state

379 12:30 pm

Pediatric Cannabis: Parents creating answers where there aren't any Gabriella Kueber, Psychology (U)

imperative for positive socio-legal transformation.

When mainstream medicine fails, parents of children with intractable epilepsy (seizures not responsive to medication) can turn to alternative medicine for help. Cannabis treatments have risen in popularity for this group, based mostly on word-of-mouth and media coverage. However, federally Cannabis is a Schedule 1 drug – alongside heroin. Nowhere is it legal for children. Because of the plant's criminalized status, scant research regarding its medical anti-seizure use has been undertaken. Without such research, doctors cannot recommend it, so parents face the task establishing the drug's efficacy – and of setting the standards related to procurement, dosing, outcomes, as well as drug-drug interactions - by themselves. How do parents overcome such minimal support and preparation to conduct research themselves? When there are no authorized answers available, why do these parents demand them from unauthorized sources?

To answer such questions we interviewed 25 parents in Southern California using a snowball sampling technique to find parents who are using, have used, or are interested in Cannabis for their children. Interviews were conducted face-to-face (n=17), or via video/telephone (n=8). Interviews lasted from 32 to 111 minutes each, with the average continuing for 66 minutes. Each interviewee also completed a brief demographic survey, to aid us in characterizing the sample.

Qualitative data reveals that, when searching for answers regarding treatments that might help their children where science has not, most parents turned to the Internet and to self-created support groups. There, parents could collect and disseminate information regarding their successes and failures. In place of official medical advice, parents placed their trust in real-life experiences. As one parent said, "You can identify with it on a different note than a doctor, or the science." In summary, the parents who spoke with us do not accept no answer for an answer. They take it upon themselves to make their own answers to what are, for them and their children, life-or-death questions.

380 12:30 pm

The Digital Divide Ian Larson, Sociology (M)

Early adoption of the internet led to what was called "the digital divide", the gap between internet access amongst racial groups. With internet access having become more easily accessible and affordable research found a shrinking divide, but the question of the divide's prominence still remained. Using the 2000-2014 waves of the General Social Survey (N=6,628), this paper examines the relationship between hours of internet usage per week and race. Using OLS regression analysis, the study found that internet usage between Hispanics, blacks, and Non-Hispanic whites are small and statistically insignificant. However, gaps between Non-Hispanic whites, Hispanics, and Blacks and those who report "other race" are sizable and significant. Given the findings, the research suggest that study concerning the digital divide shift away from access of historically marginalized groups and instead towards equality in opportunities.

381 12:30 pm

Positive and Negative Effects of Reverse Culture Shock

Jeremy Schonberg, Psychology and Criminal Justice (U)

Research in the past has tended to focus on the influences of culture shock experienced by study-abroad students while in a foreign land. Fewer studies have examined the analogous effects experienced upon returning home. The term "reverse culture shock" refers to that phenomenon—the experience of culture shock that some people feel while attempting to re-assimilate to a once familiar environment, which can be quite strenuous. We hypothesize that the levels of reverse culture shock go down as the levels of social acceptance from the host country goes up as shown by the analysis of data from students who studied abroad in the Spring of 2017, Fall of 2017, and Spring of 2018 using the reverse culture shock in student's survey.

We hypothesize that the levels of reverse culture shock go up as the levels of stress while abroad goes up as shown by the analysis of data from students who studied abroad in the Spring of 2017, Fall of 2017, and Spring of 2018 using the reverse culture shock in student's survey.

We hypothesize students that are raised in a multicultural setting who study abroad in a culture that is familiar to their home environment will experience lower levels of reverse culture shock as shown by the analysis of data from students who studied abroad in the Spring of 2017, Fall of 2017, and Spring of 2018 using the reverse culture shock in student's survey. Data for the survey will be collected utilizing a stratified, convenience-based, sample method. The web-based, online survey, is hosted on the Qualtrics website. Survey participants will access the website and enter a provided code, then follow the prompts to complete the survey. The targeted demographics for the survey are college (undergraduate and graduate level) students who have completed their course of study abroad within the past calendar year. It is our hope that the results gathered from our survey will reach a level of significance in each of the of the research hypotheses. Findings from our study will have implications for future research in the field of reverse culture shock, as well as promote the creation of mental health resources and programs to help people who experience reverse culture shock.

382 12:30 pm

College Student Stress Correlates with The Source of Financial Assistance Morgan Marvin, Psychology (U)

Money is the number one stressor for Americans and lower household income leads to higher levels of stress. Existing research concludes that severe stress is associated with: worse academic achievement, worse physical health, and higher rates of psychiatric and impulsive disorders. Students normally receive financial assistance through Gift Aid, money that does not need to be paid back (i.e. grants and/or scholarships), Self Help Aid, money that is worked for or must be repaid (i.e. loans and/or work study), aid from outside sources (i.e. parents, college fund, and/or savings), or any combination of the three in order to pay for tuition and living expenses. This study investigates how college students' GPAs and stress levels are associated with the three different sources of financial assistance and the amount of assistance the student receives from each source. We hypothesize that students who pay for 90 – 100% of their tuition and living expenses through Self Help Aid will have the highest stress levels. Participants were 203 college students, aged 18 – 79. Through an online Qualtrics survey participants answered demographic questions and questions from two widely used psychological instruments for measuring stress. One instrument included was the Background Stress Inventory (BSI), a 25 item self-report measure about distress over the past year, across five domains: financial, occupation, environment, health, and social. The financial questions from the BSI were repeated in order to evaluate financial distress over the past month. The other measure used was the Perceived Stress Scale (PSS), a 10 item self-report measure about thoughts and feelings over the past month. Results showed a statistically significant difference in GPA, financial distress over the past month, and Perceived Stress Scale scores based on the amount of financial assistance from a particular source at a significance level of p < .05. Our results concluded that Gift Aid is negatively correlated with stress and Self Help Aid is positively correlated with stress; these results may be meaningful for the national discussion concerning public university tuition and government assistance programs for college students.

383 12:30 pm

Poverty Awareness Among Social Work Students Amir Moradi, Social Work (U)

Background: Simulation experiences are often used in social work, student and teacher education(Axelrod, 1997). The Community Action Poverty Simulation (CAPS) is an evidence-based program that has been used to increase understanding of the experiences of living in poverty (Steck, Engler, 2011) so that social workers and teachers can better empathize and understand the demands of poverty on their clients.

Purpose of the Study: The purpose of this study was to examine differences between bachelors in social work (BSW) and masters in social work (MSW) students regarding their self-reported understanding and attitudes toward poverty and to determine if these changed due to participation in the CAPS program. It was hypothesized that both groups would significantly improve on their reported understanding and attitudes towards poverty.

Hypothesis: Both BSW and MSW students in study will significantly improve their attitude and understanding towards poverty from pretest to posttest.

Methods: This study is a secondary analysis of program evaluation data. Sample: A total of 58 San Diego State University social work graduate and undergraduate social work students participated as volunteers for one of two poverty simulations for teaching staff at a local public grade school.

Measures: Students were given two scales pre- and post-simulation that are provided by the CAPS program that measure 1) Understanding of poverty and 2) Attitudes toward poverty. Prior research has found that Attitudes is comprised of four factors: a) Severity of Poverty, b) Self Responsibility, c) Bad Habits, and d) The Toll Poverty Takes(Tod, Guzman, 2011). Demographic questions that were included were a rating of their own socioeconomic status (SES), college class level, gender, and ethnicity.

Analyses: Race was collapsed into white and minority. Some items on the Attitude scale were reversed scored and items were totaled for the Understanding scale and for the four factors of the Attitude scale. The BSW and MSW groups were compared by chi square analysis, t-tests and paired t-tests. The sample was also compared on socio economic status (Low and Middle-High).

Results: BSW students were older and significantly more likely to be minority as well as to rate themselves in the lower SES category as compared to the MSW students. BSW students scored significantly higher on the pre-test of Understanding poverty as compared to the MSW students however their scores were similar at post-test. While BSW students showed negligible significance in their paired sample tests of Severity of Poverty, Self Responsibility, Bad Habits, and Toll of Poverty, the MSW students showed statistical significance comparing their perspectives on Severity of Poverty between pre and post, with a two tailed significance of .02. When the sample was compared on SES from Pre to Post, results found that both Low and Middle-High improved their understanding mean from 22.65 to 23.26 and 18.11 to 21.34, respectively.

Implications: Both groups benefited from their involvement in the CAPS program as volunteers. BSW students were more likely to be minority and lower SES and have a higher Understanding of poverty at pre-test, though both groups increased their understanding to similar levels at post-test. There were few differences in scores in both groups regarding attitudes and changes in attitudes due to the simulation experience.

Conclusion: Response bias may have impacted the Attitudes toward poverty scale in both groups but MSW students showed a change in Understanding. Social work students may enter the profession for altruistic reasons and thus report positive Attitudes. Simulation experiences such as CAPS appears beneficial for increasing Understanding of the demands of clients who live in poverty, particularly for those in middle-higher SES.



Abstracts of Presentations

Session D



Session D-1

Oral Presentation: Humanities OR3 Friday, March 3, 2017, 3:00 pm Location: Pride Suite

384 3:00 pm

The Intersections of a Male Transborder Identity: The Experiences of Latino Men in the Community College Who Live Transborder Lifestyle in The San Diego-Tijuana, Mexico Region Ulises Leal, Philosophy (U)

Statement of the Problem: The purpose of this study was to explore the intersections of race, gender and culture in the context of community college among Latino men from the San Diego-Tijuana border region. Although scholars have found that most research written on men of color is focused on their experiences at four-year institutions (Harris & Wood, 2013), most men of color begin their college experience in community college institutions (Beginning Postsecondary Students, 2009). In an effort to build a body of scholarly literature on this student population through the voices of the participants we examined the following research question: (1) What are the on-campus experiences of community college Latino men students who live a transborder lifestyle in the San Diego-Tijuana border region? (2) How do community college Latino men who live a transborder lifestyle illustrate the intersections of their gender. race and transborder cultural identity?

Methods: Through a phenomenology informed research design (Clark & Cresswell, 2010; Patton, 2002), in this study we explored the on-campus and off-campus trajectory experiences of four male community college students who lived a transborder lifestyle in the San Diego-Tijuana border region. Data were collected through semi-structured open-ended one-on-one interviews. The interviews were audio recorded and transcribed verbatim for data analysis. Using the qualitative data analysis software Dedoose, we engaged in initial, focused, and axial coding (Charmaz, 2014) to analyze the data collaboratively in three integrated phases.

Results and Conclusion: The participants of this study illustrated the on-campus and off-campus experiences they shared as a result of living a transborder lifestyle. In this trajectory, students reflected about their most salient experienced lived while attending the community college. Two interrelated themes emerged from students' experiences living a transborder lifestyle, including: (1) On-Campus experiences and (2) Elements of a Transborder Identity. These themes illustrated the intersections of race, gender and culture in the context of community college among Latino men who live a transborder lifestyle.

385 3:15 pm

Philosophy: A Space of Exploration and Discovery Alec Wilkinson, Philosophy and Physics (U)

I am going to talk about my on-going philosophical research in consciousness, reality, knowledge, being, structures of experience, mysticism, intuition, love, intimacy, and etc through inquiring into both Western and Asian sources.

386 3:30 pm

Heidegger and the Postmodern Subject Ricky DeSantis, Philosophy (U)

Following the recent presidential election, there has been no shortage of op-eds attempting to explain the unprecedented divide between American conservatives and liberals. Many of these explanations have leaned on social, economic, and geographical factors. While there is certainly truth to many of these explanations, perhaps another one is worth consideration -- namely, that there is a fundamental difference in the way liberals and conservatives conceive of the human subject. Conservatives, on the one hand, tend to favor a Cartesian/Christian notion of the subject, one which emphasizes a free thinking and willing entity that stands over and against worldly concerns. In many cases this leads to a "pull yourself of up by your bootstraps" mentality in which emphasis is placed on individual choice. Contemporary American liberalism, on the other hand, has been far guicker to adopt trends in twentieth century postmodern thought in which the subject is seen as the "byproduct" of environmental forces and drives. Regardless of which outlook is more correct, there is certainly more philosophical history to support the conservative worldview. It is only recently that postmodernism has arrived on the scene, challenging many of the long standing claims about subjectivity made by the modern tradition. The purpose of presentation is to put postmodernism on more stable philosophical grounds by exploring one of the arguments that paves the way for twentieth-century thought-- specifically, Heidegger's critique of Descartes' Meditations. As I hope will become clear, Heidegger shows us that subjects are always already being-in-the-world, and do not stand over and against the world as an isolated entity.

387 3:45 pm

Cartesian Philosophy and Simulative Reality Ryan Stanford, Philosophy (U)

Through the philosophically revolutionary nature of his ideas, Aristotle's legacy undoubtedly left an enduring mark on the history and course of philosophical tradition in the West, most notably through his conception of knowledge. According to Aristotelian thought, all knowledge originates from sense experience, thus placing prodigious weight on the testimony of the senses. This conception of knowledge would serve as the conventional epistemology in the West for the following two millennia, until René Descartes, inspired by the work of Galileo, sought to overturn the prejudices injected into the Western tradition of philosophy by Aristotle. In the first meditation of his Meditations on First Philosophy, Descartes deploys extreme skepticism in which he doubts all of his beliefs, including his own sensory perception of the world, in order to establish an absolutely certain basis for his epistemology, ultimately concluding there is sufficient reason to doubt all of one's beliefs and sensory perceptions, with the exception of one's existence. However, through Nick Bostrom's Are You Living in a Computer Simulation, Descartes first meditation immediately assumes larger consequence in relation to how we as humans, simulated or not, define reality and existence as it relates to the subjects of our creation.

388 4:00 pm

Aesthetics: Dewey and Spinoza George Schieck, Philosophy (M)

Aesthetics and the various theories of art have long had a diverse and sometimes tenuous history within philosophy, ranging from Plato's imitationalism to the formalism of Kant and the emotionalism of Hume and others, along with the many variations developed from these basic classical foundations. Most recently, into the 20th and 21st centuries, the issue of artistic value broached the threshold of subjectivism and cultural relativism to the point where the question "What is art?" has been answered by whatever the artworlds of New York and Paris say it is (inclusive of Brillo Boxes, horizontal urinals, and whatever else). Indeed, it has even been postulated by professional philosophers in New York and right here at SDSU that "Art is Dead" and "Art Theory is Dead." In short, this confusing aesthetic landscape can be quite daunting to anyone who now desires to learn more about art: what it might be, where to find it, how to create it, what is beauty, and so on.

I submit that these questions of art and aesthetics are actually not that confusing, and that we can find very helpful and even compelling answers to these questions via the insights of John Dewey, as well as from recent publications by Dutton, Davies, and others who utilize recent work in neuroscience to develop their ideas. Dewey's *Art as Experience* explains how art and beauty are part of everyday life (rather than only in museums and concert halls), and the insights of Dutton, and Davies show how the sense of beauty is hard wired within our own biology. It will also become apparent, while considering Dewey and the others, how Darwinian evolution (which held particular importance for Dewey), is a significant aspect of both aesthetics and art. Lastly, the addition of Spinoza's single substance ontology (regarded by many as compelling in its own right), to Dewey's aesthetic methodology, generates a new and exciting and compelling aesthetic which is reliable, eminently feasible, timeless, and biocentric. My project is to explain how Dewey, Dutton, Davies and Spinoza might be combined.

389 4:15 pm

Mer-Made Machines: An Exploration of the Dual-Nature of Mermaids and Cyborgs Elizabeth Allison, Children's Literature (M)

The mermaid and the cyborg exist in a social position which calls into question the necessity for categorizing oneself into predetermined identities. Using Donna Haraway's "Cyborg Manifesto," I argue that cyborgs serve as a science-fiction representation of the traditional mythologicavl figure of the mermaid, rejecting rigid boundaries of society by blurring the line between human and machines/animal and commenting on the productive freedom that accepting a fractured identity can model. By refusing a strict code of binaries, and layering a complex identity, cyborgs and mermaids demonstrate agency available in a world which has been altered through their own transformation. Particularly focused on Marissa Meyer's The Little Android, a young adult retelling of Hans Christian Andersen's The Little Mermaid, I explore how the mermaid and the cyborg figures exist outside binary extremes, moving social norms away from Western patriarchal essentialism. A cyborg or mermaid body "generates antagonistic dualisms" (Haraway 180), resulting in fractured identities posed to have access to two worlds. Similarly, in these texts, the female body, loaded with the hierarchical aesthetic expectations according to patriarchal social traditions, may experience freedom, painful though it might be, establishing a path for future generations of cyborg feminists to subvert and transform their society. The protagonists of each of these texts epitomize a standard of beauty which reifies the idea of the female body as an object, and suggests the problematic nature of adhering to the aesthetic standard of a historically constructed body. Interpellated into specific ideologies of sexuality and aesthetics, these characters understand themselves as socially disobedient, and serve as examples of transformation that result in access to worlds and conversations previously inaccessible to them, blurring social boundaries.

Session D-2

Oral Presentation: Engineering & Computer Science OR3 Friday, March 3, 2017, 3:00 pm Location: Park Boulevard

390 3:00 pm

A Stochastic Model for Predicting Cell Migration through a 3D Polymer Matrix

Ben Yeoman, Bioengineering (M)

Cell mobility within a three-dimensional matrix environment can be characterized by the velocity of cell migration and the persistence length of the path it follows. Computational models that aim to predict cell migration within such three dimensional (3D) environments need to be able predict both of these properties as a function of the various cellular and extra-cellular factors that influence the migration process. A large number of models have been developed to predict the velocity of cell migration driven by cellular protrusions in 3D environments. However, prediction of a cell's path persistence is a more tedious matter as it requires following a simulated cell's path for a long time while it migrates through the model extra-cellular matrix (ECM). This is a computationally expensive process as it requires computing cell-matrix interactions in 3D and only recently there have been attempts to quantify cell persistence as a function of key cellular or matrix properties. We propose a new stochastic algorithm that can simulate 3D cell migration occurring over days within a simulation time of minutes, opening new possibilities of testing and predicting long-term cell migration behavior as a function of a large variety of cell and matrix properties. The fundamental property of the proposed algorithm that makes rapid simulations possible is that the matrix elements are generated on the go and stochastically based on the biophysical and biochemical properties of the ECM as the cell migrates through the 3D environment. Using this algorithm, we can study the effect of various cellular and matrix properties such as cell polarity, cell mechanoactivity, fiber density, matrix stiffness, fiber alignment and fiber binding site density on path persistence of cellular migration and the mean squared displacement of cells over long times. We validate the model by testing for known characteristics of cell migration - in particular the biphasic relationship of cell velocity on gel density. Beyond this, we study the combined effect of gel concentration, fiber alignment, cross-link density, cell polarity, and cell mechanoactivity on the persistence length of migration and overall cell displacement.

391 3:15 pm

Routing Protocol for Mobile Wireless Mesh Network of Multi-beam FDD Nodes Shreyas Devaraju, Electrical Engineering (M)

One of the problems of designing a mobile wireless mesh network or (MANET) is the design of a robust routing algorithm that adapt to the frequent and randomly changing network topology and provide various alternate routes from source to destination. The function of ad hoc network is very much dependent on the routing protocol that determines the path between nodes in network.

We consider a mobile wireless mesh network made of multi-beam frequency division duplex (FDD) nodes. The multi-beams FDD nodes are able to communicate with multiple nodes in different beams simultaneously and are able to form full duplex links. This allows for formation of full duplex bidirectional multi hop links between the source and destination nodes. In order to make the most efficient use of such nodes in a mesh network, we need to find loop free multiple routes between source and destination node pairs that are either node disjoint or link disjoint. We have achieved this by extending the existing reactive ad-hoc on-demand multipath distance vector (AOMDV) routing protocol with additional information regarding the full duplex bidirectional connections.

Due to mobile nature of the network we have also designed an adaptive local repair protocol to handle node failure and breaks in the routes. In this approach, each node uses the next two hop node information and beam direction, along with the knowledge of its neighboring nodes to locally repair the routes. The local repair is done such that it tries to maintain the route hop length and the node or link disjoint nature of routes.

392 3:30 pm

The Effect of Multidirectional Bias Magnetic Fields on the Converse Magnetoelectric Response of Multiferroic Composite Ring

Scott Newacheck, Bioengineering (M)

Multiferroic composites for electromagnetic (EM) coupling have been highly sought after for their ability to transduce electrical to magnetic energies with high energy efficiency and low power consumption than traditional EM paradigms. A typical multiferroic composite structure consists two or more ferroic ordered materials, typically ferroelectric and ferromagnetic materials for their piezoelectric and magnetostrictive behaviors, respectively. A revitalized topic for ferromagnetic materials is the effect of easy vs hard axis, and is a critical category in multiferroics. In the current experimental study, an out-of-plane hard axis inner Terfenol-D ring was bonded to a radially poled outer piezoelectric ring. The composite concentric ring structure was characterized under a bias magnetic field while electrically loaded near resonance to measure the in-plane converse magnetoelectric (CME) response. The bias magnetic field was varied from 0Oe to saturation (~2300Oe) while the composite ring orientations were changed from in-plane (the magnetic field in the direction of the easy-axis) to out-of-plane (the magnetic field perpendicular to the direction of the easy-axis). The change in the ring orientation thus subjected the ring to two orthogonal bias magnetic fields, which strengths was calculated based on the angle between the applied field and long axis of the ring. It was found that the CME response increased linearly with an out-of-plane bias magnetic field, while the CME response quickly reached a plateau when the bias field was in-plane. Each angled bias field had a CME behavior of some combination of both in-plane and out-of-plane responses. The largest recorded CME response of 413mG was recorded at a bias field of 1654 Oe and at a 60° with respect to the easy axis. The behavior is attributed to the effect of crystallographic structure, shape anisotropy and magnetoelastic anisotropy of magnetostrictive phase. The results reported herein has implication on the design of multiferroic high efficacy motors and wireless power transfer devices.

393 3:45 pm

Predictive Bone Remodeling Using In-Silico Simulations to Support Developments of Advanced Orthodontics

Jose Gonzalez, Mechanical Engineering (M)

Recent studies have been published reporting breakthroughs in the application of finite element studies in the design and analysis of advanced orthodontics. A significant shortcoming in these studies, however, is the fact that FEA has not captured the bone remodeling response to these advanced orthodontics. In turn, the results of these simulations report an unrealistic displacement around the nasal bride that is an incomplete study of the bone response. On the other hand, bone remodeling has been previously documented in FEA codes and has proven to show bone adsorption and absorption in response to stresses in femur bone models. However, the dynamic relationship between mechanical stimulus and bone remodeling has not been reported in orthodontic studies due to the complexity of the skull structure. In the current study of bone remodeling using FEA code, the elements' strain energy is used as the mechanical stimulus to the remodeling process, based on which the density and elastic modulus are calculated. Additionally, we developed an algorithm that dynamically collects, sorts, and bins the stresses in all elements for regional remodeling calculation based on the proximity of the element to the load application site. The results demonstrate that bone response to orthodontic appliances is different than that of a FEA code without bone remodeling consideration. The appliances' intended effects are altered by the bone remodeling when compared to those without remodeling. Cephalometric landmarks were tracked for displacement, rotation, and stresses and strains. These landmarks show that those

closer to the appliance, as well as those around pivot points, experience an increased rate of adsorption (43-60%) than those further away.

Our results suggest that it is possible to dynamically combine the use of FEA and bone remodeling, and with further studies can be implemented to better predict orthodontic appliance results.

394 4:00 pm

Biologically-inspired fiber reinforced hydrogel composite: A mechanics-based study

Nicholas Martin, Mechanical Engineering, Bioengineering (M)

The objective of this research was to first fundamentally understand the significance and contribution of the microstructure of the nucleus pulposus of the intervertebral disc on the functionality and mechanical behavior of the nucleus and the entire disc. In turn, this understanding was used to synthesize a surrogate composite material that mimics the characteristics of the natural nucleus pulposus. Previously, nucleus pulposus replacement attempts have not considered the inhomogeneity and anisotropy of the native nucleus pulposus, and therefore do not accurately mimic the biomechanics of the intervertebral disc. The motivation for these specific objectives is the association of lower back pain and the degeneration of the intervertebral disc, which is a major societal and economic problem in industrialized societies. Of specific focus to this research is the nucleus pulposus due to its vital physiological and mechanical functionalities to the entire motion segment. The nucleus consists of short, discontinuous collagen and elastin fibers (~15%) that are suspended in aggrecan matrix with 70% of its wet-weight as water. To utilize this biological structure and to uncover the mechanical and physical significance of the microstructure and fiber content, a theoretical formulation of micromechanics of random discontinuous fibers in a polymer matrix was used. The experimental investigation was proceeded by constructing new synthetic materials consisting of alginate/polyacrylamide hydrogels with the inclusion of chopped E-glass fibers. The quasi-static and viscoelastic properties were then tested and compared to the results of those published for the natural nucleus pulposus. For model validation, these alginate/ polyacrylamide hydrogels were cross-linked by five different multivalent cations. It was found that the inclusion of E-glass fibers increased the storage modulus by 44 percent. The hydrogels were tested at frequencies ranging from 1 to 10 Hz, with the inclusion of fibers having a greater effect at the lower frequencies (47% storage modulus increase) and having a decreased but remained significant effect at the higher frequencies (42% increase). The results of this research can be used to transform the design methodologies for the next generation of disc replacement technologies by more accurately mimicking the natural functioning of the intervertebral disc.

395 4:15 pm

Effect of Extended Ultraviolet Exposure on the Mechanical Performance of Polyurea Elastomers Mohammed Atif Shaik, Mechanical Engineer (M)

Polyurea is a thermoset elastomer employed in both civilian and military domains due to its exceptional impact mitigation properties over a wide range of frequencies and large tearing elongation has justified its use in armors as protection against biomechanical and hypervelocity projectiles. However, during field deployment, these armors are subjected to extreme weathering such as extended ultraviolet radiation, resulting in gradual deterioration and eventual failure. In the present study, the acoustic, hyperelastic and dynamic mechanical properties of polyurea as a function of exposure duration to UV radiation are reported. Six sets of polyurea samples were exposed to UV radiation in an oxidizing environment for different duration upto 15 weeks. A set of unexposed PU sample were used as a control set. Discoloration of the samples was observed after 3 weeks of exposure and gradual change to opaque tan after 15 weeks. Additionally, onset of crazing was observed in samples starting from 3 weeks of exposure. As the exposure duration increased, the depth and distribution of surface cracks increased due to development of shrinkage strain based on the diffusion of oxygen in the degraded surface layer. The effect of extended UV radiation on the acoustic properties was noted to be minimal, where elastic and shear moduli decreased monotonically after an initial increase during the first 3 weeks of exposure. The overall hyperelastic behavior of polyurea remained unaltered in spite of 15 week of constant UV exposure where no permanent failure was recorded at the gauge length up to 250% strain, thereby supporting the conclusion of the insensitivity of polyurea's hyperelastic behavior to UV radiation. The dynamic mechanical properties measured using a dynamic mechanical analyzer showed an initial increase in the dynamic modulus after 3 weeks with no further significant change in the stiffness thereafter. It was found that the UV exposure had a significant impact at relatively short loading times (up to 6 decades) or low temperatures. With the increase in loading time or higher operating temperatures, the effect of UV exposure and temperature on the performance became highly coupled. Obtained results had major implications on armors design and deployment.

Session D-3

Oral Presentation: Business, Economics & Public Administration OR2 Friday, March 3, 2017, 3:00 pm Location: Tehuanco

396 3:00 pm The impact of Design Thinking Francesco Chinaglia, Marketing (U)

Design thinking refers to creative strategies designers utilize during the process of designing. However, design thinking is also an approach that can be used to consider and resolve problems not only pertinent to the professional design practice. This research addresses the impact that design thinking has on people's approach to different types of problems and how design thinking can be applied in business, to social issue, and even to people's personal lives. The research utilizes both primary data, which has been collected through interviews and surveys, and secondary data, which has been gathered mainly from books such has Design your Life and from articles published by the founders of Ideo, to show to a vast audience how a different and strategized approach to problems can enhance people to find more fitted solutions. The outcomes of the research showed that out of the 102-people part of the study, the people familiar with the process of design thinking could assimilate and approach problems even outside of their field of knowledge three times faster than the others. Moreover, the research showed how 82% of the people familiar with design thinking had a clear idea of what their 5 and 10 years' plan was while only 24% of the others did. The research exposed many interesting insight of design thinking and its effects on people.

397 3:15 pm

Entrepreneurs: The Inside Story Rosemary Blesio, Marketing (U)

What are the common characteristics and traits that build the success of an entrepreneur? This is a question Shanley and I have often wondered throughout our business careers here at San Diego State. Therefore, we have decided to use the 2017 Student Research Symposium as a means to reaching the answer to our question.

To reveal the underlying qualities of the fulfilled entrepreneur, we will conduct research into the personal and business lives of several entrepreneurs within our network. We have constructed a deep and extensive questionnaire and will engage with key individuals through interviews and personal conversations. We hope that through this method we will deepen our insight into what it means to be an entrepreneur.

As students of the College of Business, our intention is to enlighten ourselves and our peers with a greater understanding of the many opportunities within our field.

398 3:30 pm

Easy Made Cosmetics

Brian Ruthenberg, Marketing (U)

I develop private label and custom cosmetics for companies. These companies include but are not limited to: Barbershops, Salons, Hotels, and Massage Facilities. There are a series of meetings and steps we walk them through to ensure that they are a proper fit for this service. It helps save them money because they are able to get the products at a manufacturing price, and it also builds shop credibility.

399 3:45 pm

Megachurches and Social Media Erick Pedraza, International Business (U)

E-Church: Analyzing the Business Practices of Megachurches.

Defined as a protestant church with a congregation of more than a 1000 people, megachurches are flourishing in the United States and in the world. Some of the largest megachurches boast congregations of 800,000 people. Given the increasing influence of these large institutions, it is important to understand them and study them.

In this study, we explore the industry trends and business practices in the religious sector, with particular focus on megachurches - in the global, national and local context.

Our research is mainly qualitative in nature and focuses on the factors that allow megachurches to emerge and flourish, with particular focus on social media and use of technology in marketing strategies. We also examined the internationalization of megachurches by investigating whether the US churches have or are attempting to have international presence.

Methods of research include the use of secondary data found in various databases and information publicly available online. We also sought to gain insights from interviews with megachurches' employees and leaders in the San Diego County. In addition, our research includes case studies of the emergence of various megachurches. We analyzed our data to find similarities and difference across them and to better understand their *modus operandi*.

We hope our study and its findings provide some interesting insights on the megachurch phenomenon.

Session D-4

Oral Presentation: Behavioral & Social Sciences OR7 Friday, 3:00, March 3, 2017 Location: Aztlan

400 3:00 pm

English tense and agreement morpheme use in bilingual and monolingual speakers Sophia Kelly, Speech-Language Pathology: Specialization in Bilingualism (M)

Bilingual children acquiring English may demonstrate errors in language as part of a typical acquisition process. This proves problematic when trying to determine if a bilingual child has a language impairment because the child's language acquisition patterns can overlap with language impairment patterns. For example, morphology is a known area of weakness for children with language impairment. Bilingual children acquiring English may also demonstrate errors in verb production as part of a typical acquisition process. Therefore, investigating morphological development in bilingual children will help us better understand how to distinguish typical and atypical language development in a highly heterogeneous population.

Presently, we investigate patterns in the use of tense and agreement morphemes in English language learners (ELLs) using three novel measures of emergence and productivity (Hadley & Short, 2005). The clinical utility of these measures has been established for monolingual children (e.g., Gladfelter & Leonard, 2013), but not yet for bilinguals. Participants include 74 Spanish-speaking ELLs (Mean age= 58.7 months, SD=5.4, 39 males), 14 Vietnamese-speaking ELLs (Mean age= 59.3 months, SD= 4.6, 7 males) and nine monolingual-English speakers (Mean age= 59.7 months, SD= 4.2, 5 males) to serve as a comparison group. Spontaneous language samples were collected, transcribed, and analyzed for tense and agreement morphemes following the procedures outlined in Hadley and Short (2005).

Preliminary qualitative results indicate the novel measures capture growth over the period of a school year for all three groups. However, performance at the end of the school year indicates that morpheme productivity differs slightly between each group. Both the Spanish-speaking ELLs and the Vietnamese-speaking ELLs exhibited lower morpheme productivity scores across all morphemes in comparison to their monolingual English peers. Statistical analyses are in progress to determine significance of these qualitative results.

Investigating alternate measures of morphological development in ELLs provides useful information to speech-language pathologists regarding appropriate assessment measures. Our preliminary findings suggest that ELLs that speak a variety of first languages have morpheme patterns that differ from their monolingual English peers. These findings have important implications for future investigations of the language development in linguistically diverse populations.

401 3:15 pm

Effects of Iconicity on Cross-modal Translation Priming in Hearing Learners of American Sign Language and Deaf Native Signers: an ERP Study Megan Mott, Psychology (M)

This study examines cross-modal translation priming (printed English to ASL signs) in individuals with minimal knowledge of ASL and in deaf native signers. EEG was recorded as participants watched video clips of a signer producing 80 ASL signs (40 signs primed by a congruent English translation/ 40 primed by an unrelated English word). Half of the ASL targets were iconic signs (signs that have a non-arbitrary mapping between form and meaning) while the other half were non-iconic (based on normative ratings). ERPs time-locked to the onset of the video clips were averaged across a group of 20 native signers and a group of 24 hearing speakers of English who had recently learned all 80 signs through associative learning protocols in a laboratory setting (each English/ASL pair presented 5 times across two learning sessions). ERPs of the hearing learners showed expected repetition effects (an increased negativity to unrelated translations compared to congruent translations) beginning 600ms after clip onset for iconic signs, and at 800ms for non-iconic signs. Repetition effects (for both sign types) were evident in the ERPs of deaf signers 500ms after clip onset. These results suggest that, while cross-modal translation priming effects are observed in the ERPs of hearing learners of ASL within the first few hours of instruction, the time-course of these effects is delayed compared to native users of ASL. These results also suggest that iconicity of a sign facilitates priming for new learners of ASL, but does not affect the time-course of processing for native signers.

402 3:30 pm

Language Variations in the Dominican Republic Adriana Moosekian, Spanish (M)

In order to better understand the conceptual process of language attitudes and how stigmatized varieties develop, language must be studied in a social context. Dominican Spanish is one Hispanic language variety that carries a high stigma and is awarded little prestige both internationally and even by its own speakers. However, in the Dominican Republic, literature says that various phonetic processes distinguish regional speakers from one another, and are tightly tied to varied levels of socioeconomic stereotypes. While Dominican and Caribbean Spanish in general is known for certain phonetic characteristics (namely its aspiration or elision of 's' sounds, and for its weakening of intervocalic 'd' sounds), it is various manifestations of 'r' and 'l' sounds that separate Dominican accents and most contribute to stereotyping of people based on their form of speech. The purpose of this project is to develop an audio library of the primary Dominican accents: cibaeño (Northern), capitaleño (the National District), sureño (Southwest), as well as those from the East and Haiti. This audio data sets the groundwork for a future sociolinguistic study of implicit language attitudes in the Dominican Republic.

403 3:45 pm

Convergence and Divergence in the Predictions of Looking vs. Haptic Measures Erin Smolak, Language and Communicative Disorders (D)

Word knowledge in infants and toddlers is assessed using a variety of measures, including both looking and haptic responses. Research suggests that these response types are differentially sensitive to the level of infants' early knowledge. For example, looking measures appear to be more sensitive to partial knowledge, whereas haptic responses require more robust knowledge (Gurteen, Horne, & Erjavec, 2011; Hendrickson, Mitsven, Poulin-Dubois, Zesiger, & Friend, 2015). The current research seeks to investigate the convergence and divergence between these methods when predicting language and cognitive outcomes.

Forty-five English-speaking monolingual children were tested at 22 (M=22;54) and 48 (M=49;17) months of age. At 22 months, children were administered the Computerized Comprehension Task (CCT; Friend & Keplinger, 2003; 2008) and a modified Looking-While-Listening (LWL; Fernald et al., 2008) methodology simultaneously. At 48 months, outcomes included narrative skill, language complexity and diversity during a narrative, and vocabulary comprehension on the Peabody Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1997). Regressions indicated that the CCT predicted both language complexity (F(1,39)=12.77, η_p^2 =.25, p=.001) and vocabulary comprehension, (F(1,40)=6.74, η_p^2 =.14, p=.013) when controlling for demographic variables and the LWL. The LWL was correlated with vocabulary comprehension (r(44)=-.35, p=.020); however, when controlling for the other predictors, it did not predict any 48-month outcomes (all ps>.110). Relative importance analyses (Johnson, 2000), created to better partition variance to correlated predictors, suggested that the CCT numerically predicts more variance in outcomes than the LWL.

A correct haptic response requires a robust, decontextualized representation of a given word, whereas eye gaze is not as computationally expensive, and can therefore capture partial word knowledge (Hendrickson et al., 2015). Both types of knowledge were correlated with receptive vocabulary size at age 4, although only the CCT accounts for additional unique variance. This suggests word processing predicts vocabulary development (Marchman & Fernald, 2008), but not above and beyond decontextualized vocabulary knowledge. Further, decontextualized word knowledge may be required in order to produce complex language (e.g., McGregor et al., 2012). Therefore, the extent to which children have robust representations of vocabulary items may be more related to this skill than speed of word processing.

404 4:00 pm

Phonological and semantic priming in American Sign Language: An ERP study

Brittany Lee, Language and Communicative Disorders (D)

Although previous ERP studies have demonstrated N400 semantic priming effects for sign language, almost nothing is known about the neural dynamics of form-based priming or how semantic and phonological priming effects interact in a visual-gestural language. Using ERPs, this study investigated the time course of phonological and semantic priming in American Sign Language (ASL). Deaf ASL signers viewed pairs of ASL signs (with a 1300 ms stimulus onset asynchrony) and judged semantic relatedness. Half of the semantically unrelated signs were phonologically related and half were not. Phonological relatedness was defined as sharing two out of three phonological units: location, handshape and/ or movement. Results show effects of both semantic and phonological relatedness. Target signs in semantically related pairs elicited faster responses and smaller amplitude N400s than those in semantically unrelated pairs, mirroring the classic semantic priming effects reported for spoken word recognition. Target signs in phonologically related pairs also elicited smaller amplitude N400s than targets in phonologically unrelated pairs, paralleling the N400 priming effects observed for rhyming words in spoken language. However, phonological overlap interfered with semantic relatedness judgments such that responses were slower for phonologically related pairs than for phonologically unrelated pairs. We hypothesize that similarity in form interfered with participants' ability to reject a semantic relationship between the signs. Overall, the results indicate a similar time course of lexical access for signed and spoken languages and that spreading activation between form-related lexemes is modality independent.

Session D-5

Oral Presentation: Biological & Agricultural Sciences OR5 Friday, 3:00, March 3, 2017 Location: Metztli

405 3:00 pm

A metatranscriptomic approach for characterizing host immune responses to bacterial virulence factors in the coral holobiont Saichetana Macherla, Bioinformatics and Medical Informatics (M)

Coral reefs are hotspots for biological diversity harboring some of the highest metazoan biomass in the sea. Corals live in symbiosis with photosynthetic dinoflagellates (zooxanthellae) and many other microscopic organisms collectively referred to as the coral holobiont. Studies have shown that there is significant exchange of dissolved substrate across the interface where corals and algae interact, which promotes high microbial abundances and activity. Since it has been shown that microbial communities associated with the coral-algal interface are enriched with members closely related to known bacterial pathogens, we hypothesized that the virulence factors (VF) transcribed by these microbes will trigger an immune response by the coral animal such as activation of the tumor necrosis factor (TNF) ligand, which initiates the pathway that leads to cell apoptosis. To our knowledge, no studies have shown an association between virulence factor proteins and host immune response at the coral-algal interfaces. Tissue punches across coral and algal interface were collected from Southern Line Island atolls. Samples were frozen in RNAlater for transport back to the lab, where nucleic acids were extracted; libraries were then constructed and sequenced using Illumina technology. Ten clean RNA and DNA sequence libraries from two islands which represent five punches across the coral-algae or heterospecific coral-coral interactions, were included in the study. Both host immune responses (including the TNF pathway) and the relative abundances of virulence factor transcripts were estimated through sequence similarity comparisons to existing databases using BlastX. These preliminary comparisons demonstrate an up-regulation of TNF ligand at both coral-coral and coral-algae interfaces. Further studies, which will include more metatranscriptomes are required to determine which VF gene activates the TNF ligand at both coral-coral and coral-algal interactions.

406 3:15 pm

Student Research Symposium 2017

The effect of therapeutic VAX-IP minicells on the colonic microbiome in a CRC mouse model Shea Grenier Davis, Molecular Biology (M)

Colorectal Cancer (CRC) is the third most common cancer in the United States. We are investigating the therapeutic potential of VAX-IP, bacterial minicells that are E. coli based, achromosomal bacterial particles that deliver the pore-forming toxin Perfringolysin O (PFO) to cancer cells through the integrin-attachment protein Invasin. VAX-IP has been demonstrated to significantly reduce tumor growth in an orthotopic bladder cancer model but have vet to be evaluated in colon cancer. For this study, a conditional knockout mouse model of colon cancer, FABP-CreXAPC^{fl468}, is being utilized. This model involves a colon-specific deletion of the APC gene, a target often mutated in human cancer. When VAX-IP are delivered to these mice intra-rectally from 14-19 weeks of age, a time when tumor development is underway, they have been shown to reduce tumor load when compared to controls (p< 0.01). In humans, CRC is associated with a number of risk factors, including diet, which may be interpreted as being directly related or influenced by the intestinal microbiome. To date, a number of studies have associated taxonomic and functional deviations in the intestinal microbiota with the development of diseases, such as colon cancer. Therefore, this project aims to evaluate the effect of VAX-IP on the intestinal microbiome. Microbiomes were isolated from frozen tissues adjacent to colonic polyps in FABP-CreXAPC^{fl468} mice and

sequenced using "shotgun" metagenomics. Bioinformatic analysis tools characterized gene function and taxonomic representation. Preliminary results of these colonic mouse model microbiomes display significant variability at the highest taxa with microbial populations dominated by the Bacteriodetes, Firmicutes, and, unexpectedly, Proteobacteria. Microbiomes (n=8) in FABP-CreXAPC^{fl468} mice treated with VAX-IP minicells display a significant increase in the relative abundance of the phyla Euryarchaeota (p< 0.05) and genes involved in regulation and cell signaling (p= 0.01) compared to PBS-treated controls. Overall these studies suggest VAX-IP could be promoting the abundance of facultative anaerobes involved in nutrient cycling.

407 3:30 pm

Bioinformatics approach to analyze racial disparity in colorectal cancer using RNA-seq

Priyadarshini Mamindla, Bioinformatics and Medical Informatics (M)

For several cancer types including colorectal cancer (CRC), race is now considered to be one of the risk factors in the United States. Studies on CRC show that, incidence and mortality rates are more prevalent in African Americans (AA) than in Caucasian Americans (CA). Published studies on Differential Expression (DE) analyses of RNA-seq and microarray data show that genes are differentially expressed among AA and CA cancer patients. In our study, we were interested in performing DE analyses on CRC using RNA-seg data from The Cancer Genome Atlas, as there are more patients available than previously studied and, also, RNA-seq data has not been used before for DE race studies in CRC. We were interested in looking at immune pathways that might differ between AA and CA patients, as we know that immunity plays a major role in the development of tumors and cancer progression. Our DE analyses using 240 patients, including 51 AA and 189 CA, identified six immune pathways over-expressed in CA versus AA patients: antigen processing and presentation, proteasome, cytokine-cytokine receptor interaction, toll-like receptor signaling pathway, chemokine signaling pathway and T cell receptor signaling pathway. These pathways were considered to be the most significant immune pathways, as they are generally involved in antigen processing and presentation and in anti-tumor cytotoxic immune activity associated with a reduction in tumor progression. These immune pathways that are over-expressed in CA patients may, then, contribute to the differences observed between CA and AA patients and might be a possible reason for the higher incidence and mortality rates of CRC seen in AA patients. Moreover, in accordance with a previous study from our lab on prostate cancer, an antigen presenting gene, HLA-DPA1 was seen to be over-expressed in CA patients, potentially acting as a biomarker for gene expression differences seen in CA and AA.

408 3:45 pm

Occurrence of crAssphage in various metagenomes Sabrina Parlan, Bioinformatics and Medical Informatics (M)

CrAssphage is an incredibly abundant bacteriophage with an abnormally large genome, about 97kbp. It has been found in the majority of published human fecal metagenomes. This phage has been determined to target *Bacteroides*, a genus of bacteria which makes up most of the mammalian gastrointestinal flora and has been found to contribute to human obesity and diabetes. Using tools in bioinformatics, 15bp length k-mers will be extracted from the crAssphage genome sequence, and a list will be created of all of the 15-mers and their position in the genome. The occurrence of each 15-mer from crAssphage will then be counted in other metagenome sequences. This will allow us to determine the presence of crAssphage, or other phages will similar genomes, in other environments.

409 4:00 pm

Optimization of microbiome assembly and binning within metagenomes Bhavya Nalagampalli Papudeshi, Bioinformatics and Medical Informatics (M)

Microbiome/host interactions describe characteristics that affect the host health which is of utmost importance in medical and agricultural industries. Shotgun metagenomics is an applied technique that provides an unprecedented view of the microbial community structure and functions. Current challenges in dealing with metagenomic data includes genome reconstruction that enables linking taxa to function, and overcoming database bias which causes for sequences to remain unidentified. New tools are rapidly evolving to group phylogenetically related sequences into bins, which allows for genome reconstruction. Prior to the application of these binning tools on microbial communities varying in diversity, the quality of metagenome assembly influences the quality of the bins. We have therefore developed a pipeline that performs quality control to both assembly and binning tools of microbiomes that vary in their biological characteristics. The workflow begins with testing three assemblers, SPAdes, IDBA, and MetaVelvet, and two binning tools, MetaBat, and GroopM. Binning tools extract sequences to bins based on genome signatures, such as tetranucleotide frequencies and contig covergae. This pipeline was optimized using four microbiome projects that were sequences in different platforms (IonTorrent and Illumina), vary in diversity and environment (Abrolhos Bank, Brazil, and Point Loma, CA, USA), a total of 105 metagenomes (15.5 GB of data). We conclude that the optimal assembly tool is SPAdes which provided higher contig continuity and lesser contig chimerism. We conclude that the optimal binning tools is MetaBat as it resulted in bins with less GC content variation and species richness with higher genome completeness. MetaBat extracted 117 bins from the 4 projects. Sixty six

bins were identified as population genomes with sequences belonging to a specific genus, therefore enabling identification of taxonomic origin of specific functions. Fourteen bins that remained as "unidentified" using reference based study, but had greater than 50% genome completeness was defined as novel population genomes. Identification of these novel bins provide a comprehensive understanding of the host health and deposition of these sequences to the database help decrease database bias. Using this pipeline across microbiomes will improve our understanding of the microbial community and enable targeted interventions.

410 4:15 pm

Using Read Mapping to Estimate the Abundance and Ubiquity of the Newly Discovered Bacteriophage, crAssphage, in Metagenomic Samples

Kyle Levi, Bioinformatics (M)

Bacteriophages represent the largest portion of undiscovered organisms on the planet. Numerous factors contribute to the difficulty in culture, isolation and identification of phages, however, technological advances in DNA sequencing, specifically in metagenomic sequencing, have provided new avenues to study phages and their role in microbiomes. CrAssphage is one such newly discovered bacteriophage that is found in about half of all human fecal microbiomes, yet much of this phage's function in the microbiome remains unknown. Here we use Bowtie2 to estimate the of ubiquity crAssphage across different metagenomes as well as its abundance within each metagenome and to compare it to the well studied P2 phage. We searched almost 100 terabytes of data from the sequence read archive (SRA) database - 39,546 metagenomes. From each metagenome, 100,000 reads were extracted and searched for reads containing crAssphage and P2 phage. While P2 was found significantly in 256 of the samples, crAssphage was found in 1,306. Additionally, significantly more reads were found that matched to crAssphage.

Session D-6

Oral Presentation: Physical & Mathematical OR2 Friday, 3:00, March 3, 2017 Location: Templo Mayor

411 3:00 pm

Self-Assembly of Pyrogallol[4]arene Molecular Capsules in the Solid State Shaylyn Brim, Chemistry (U)

Molecular encapsulation is studied in organic chemistry because of its ability to entrap small molecules in structured environments that can control properties and chemical reactions. In this project, we sought to test whether one type of molecular capsule, a pyrogallol[4]arene hexamer, could be assembled under novel, solid-state conditions, leading to

small molecule encapsulation that cannot be attained by any other known method. Different ratios of pyrogallol[4]arene and small molecule guests were placed in a bill mill and milled at 30 Hz for 1 hour, with periodic sample removal. Dissolution of the samples in nonpolar solvents and analysis by 1H NMR spectroscopy showed that guest encapsulation complexes were obtained by ball milling, and that these complexes were different from the molecular capsules obtained when the samples were not milled. Encapsulation studies using a set of small molecule alkanes and arenes, plus an amine and a carboxylic acid, reveal relationships between guest structure and the efficacy of ball mill-induced encapsulation. To gain a better understanding of the complementarity between host and guest, we have also developed robust methods for growing single crystals of pyrogallol[4]arene hexamers in solvents that do not hydrogen bond and therefore will not disrupt the assemblies. These results show that the search for methods to form novel encapsulation complexes should not be limited to classical approaches to self-assembly in solution.

412 3:15 pm Mucus Model Elena Arroyo, Physics (U)

Mucus networks have recently garnered attention in their potential to aid phages in their search for bacterial hosts. Despite this, the complex interactions between the mucus, phages, and bacteria are still largely unexplored. Several possible mechanisms by which mucus could aid phages are (1) phages stick to mucus, thereby increasing the encounter rate with bacteria (2) bacteria influence the viscoelastic properties of a mucus network making it easier for phages to move towards them. A large-scale parallel computer simulation of a mucus network that we are currently developing will be discussed. In this model mucins contain three different types of groups: polar (P), hydrophopic (H), and sulfide (S). Several properties of the mucus network will be shown and compared with experimental data. For example, the radial distribution function of the H and S groups and the lifetimes of the HH and SS bonds that these groups form. In the future, we plan to use this code to study the mucus, phage, and bacteria interactions.

413 3:30 pm

tCc – A New Family of Fluorescent Nucleosides Katrina Ngo, Chemistry (U)

Fluorescent nucleotides can act as useful molecular probes as well as fluorescent markers for the study of nucleic acids, but brighter probes are needed for new applications including fluorescence microscopy. Previous work done in our group on nucleoside analogs has led to the development of a new generation of modified fluorescent analogs known as tricyclic cytosines (tC), which are able to participate in normal G:C base pairs in DNA while functioning as molecular probes. The properties of these tC compounds led us to propose a new structure for fluorescent nucleotide design, tCc. We hypothesize that tCc compounds will be the most fluorescent of the cytidine analogs because of the stronger conjugated system that exists within the molecule. We used an efficient series of synthetic reactions to construct the molecule, and we characterized the intermediates and products using 1H NMR spectroscopy and mass spectrometry. The main ring system of the molecule was built using a series of reactions that included the Vilsmeier reaction and the Knoevenagel condensation for critical C-C bond forming steps. The unique carbon-carbon bond linking the sugar to the nucleobase was achieved by utilizing the Heck reaction and our nucleoside analogue was confirmed via NMR spectroscopy and mass spectrometry. Initial observations show that the parent tCC compound is fluorescent, but further tuning will be needed to maximize its brightness. In the future, we intend to synthesize derivatives consisting of various electron withdrawing and electron donating groups to further tune the conjugation. Future steps include transforming our nucleosides into nucleoside phosphoramidites and incorporating them into DNA using solid-phase synthesis.

414 3:45 pm

A Nucleophilic Atroposelective Kinetic Resolution (ANKR) Towards the Scalable Synthesis of Highly Selective Pyrrolopyrimidine Kinase Inhibitors Mariel Cardenas, Chemistry (Organic Chemistry) (M)

Atropisomerism is a form of extended chirality that is common throughout drug discovery, particularly in kinase inhibition research. While rapidly interconverting atropisomers may not appear chiral, they bind to their target active sites in a single atropisomeric conformation, with the non-relevant atropisomer contributing little to the desired activity. However, this polypharmacology often leads to adverse side effects in patients. We have recently exploited atropisomerism to increase the target selectivity of promiscuous pyrrolopyrimidine (PPY) kinase inhibitors, mostly addressing the issue of polypharmacology in atropisomeric kinase inhibitors. Access to atropisomerically pure material is a current bottleneck in the field, as there is currently a reliance on semi-preparative chiral high-performance liquid chromatography (HPLC) to obtain enantiopure materials. This avenue is both expensive and time-inefficient, limiting the scalability of this synthesis. Exhaustive searches using the library's resources have yielded few practical late-stage, enantioselective transformations to synthesize selective PPY kinase inhibitors on the gram-scale or higher.

Previous reports in literature have demonstrated a desymmetrization strategy of meso- biaryl compounds, yielding stable atropisomeric products, with high enantioselectivities. Inspired by this work, we hypothesized a cation-directed nucleophilic addition of thiophenol could effect the Kinetic Resolution of atropisomerically stable PPY scaffolds, yielding atropisomerically stable products with high enantioinduction. Consequently, the remaining unreacted starting material would thereby be enantioenriched as well. Herein, we report a new route towards the scalable synthesis of pharmaceutically relevant classes of atropisomers via an Atroposelective Nucleophilic Kinetic Resolution (ANKR) of heterocyclic compounds. We have applied this transformation towards the synthesis of various enantioenriched PPY scaffolds, yielding both enantioenriched starting materials and products. Optimized reaction conditions have resulted in kinetic resolutions with a krel of 35 or higher, allowing for access to highly enantiopure starting material at conversions slightly above 50%. Finally, we are exploring further functionalizations of both the enantioenriched product and starting materials, without degrading atropisomeric purity.

415 4:00 pm Structural Optimization of Atropisomeric Pyrrolopyrimidine RET Kinase Inhibitors Sean Toenjes, Chemistry (D)

Aberrant kinase activity is involved in many different diseases, focusing research efforts towards the development of small molecule kinase inhibitors. Although each kinase plays a specific role in these pathways, the active sites of these kinases are highly conserved throughout the kinome, making it difficult to selectively inhibit a specific kinase. Inhibitors often bind to both the target kinase and off-target kinases leading to unwanted off-target effects.

Many kinase inhibitors contain at least one rotational axis between two aromatic rings. This leads to an extended form of chirality called atropisomerism, where the two different rotational conformers can either exist as a rapidly racemizing mixture or isolable enantiomers. Most bioactives, as designed, exist as a rapidly interconverting atropisomeric mixture, however, when they bind to target active site, they tend to do so in an atropisomeric fashion. The presence of the non-relevant atropisomer via interconverting atropisomerism or a stable racemic mixture can result in off-target inhibition.

In efforts to solve this problem, our lab exploited atropisomerism as a selectivity filter to represent a strategy to increase kinase selectivity. In our report, we rigidified a biaryl axis by adding steric bulk adjacent to the axis and found the (R)-conformer to be 5x more selective towards RET kinase than the (S)-conformer after a partial kinome screen. The current compounds synthesized are great early stage 'lead molecules' but need to be further optimized for potency and selectivity in order to fully exploit this strategy. To accomplish we first identified potential analogs by screening various substituent combinations of the (R)-configuration using a molecular modeling software. After conducting QSAR and ranking the results by potency, we established a list of priority molecules to be synthesized. We synthesized lead molecules and separated the stable enantiomers via semi-preparative HPLC to obtain enantiopure compounds. We then screened these analogs in vitro against RET, YES, SRC, and VEGFR kinases testing for potency and selectivity, consistently realizing atropisomerism was a major contributor towards the increased selectivity. As more compounds are tested, we will iteratively optimize the computational models to help drive optimization towards RET, potentially leading to valuable chemical probes.

416 4:15 pm

The Catalytic Sulfenylation of Electron Rich Bio-Actives and FDA Approved Drug Christopher Nalbandian, Chemistry (D)

Abstract: Aryl sulfides are common moieties and synthetic intermediates in drug discovery and material science. For example, the kinase inhibitor axitinib is a recent example of the many aryl sulfides in drug discovery along with the late stage intermediate in the synthesis of omeprazole. The direct formation of C-S bonds from unfunctionalized starting materials has received recent attention with examples of both metal catalyzed C-H functionalization and aromatic sulfenylation that proceed via electrophillic aromatic substitution (EAS). To our delight we have recently developed a new catalytic sulfenvlation of electron rich heterocycles. Our mild catalytic system has allowed us to incorporate several different groups off of the sulfur in our reagents. The R groups off the sulfur include: cysteine, alkyl linkers, aromatic linkers, and a new electrophilic azide reagent. With our linkers we have stapled peptides using 2 tryptophan residues in moderate yields. The newly developed electrophilic azide reagent has incorporated azides in one step, into bio-molecules such as peptides, bioactives, and Naratriptan (FDA approved drug for migraines) in good isolated yields 49%-90%. Bio-orthogonal chemistry (chemistry occurring in a living system) has inspired many scientists and researchers to develop conditions for elucidation of bio-molecular targets, and our catalytic sulfenvlation and electrophilic azide source will provide new tools for bio-orthogonal chemistry.

Session D-7

Oral Presentation: Visual or Performing Arts OR4 Friday, 3:00, March 3, 2017 Location: Visionary Suite

417 3:00 pm

Common Language of Arts Nhu Nguyen, Dance (U)

In Common Language of Arts, I studied several fundamental elements that artists across disciplinary often consider during their creative processes. This research was intended to identify the common concepts shared by different art forms and examine the contextual meanings of these concepts in order to compare and contrast their usages across various disciplinary. In an effort to blur the lines differentiating visual and performing arts, Common Language of Arts was designed to bridge the conceptual gaps separating artists from different forms by focusing in preexisting fundamental knowledge in terminologies shared by these forms. By highlighting these similarities, it is my hope to spark an opportunity to cultivate cross-cultural understanding among members of seemingly separate communities in art, as an example to how cross-cultural understanding might be cultivated in our contemporary world through one common experience at a time.

418 3:15 pm

Successful Scenic Design for Children's Theatre Victoria Vitola, MFA Theatre Arts Design and Technology (M)

In designing for theatre, each designer will place emphasis on certain techniques, elements, and tools that, when used in unison, create an approach to designing a production. A designer's approach will fluctuate depending on the type of show or genre of entertainment being designed. For instance, a scenic designer will approach designing a dance production differently than designing a play because the two types of entertainment are fundamentally different. This leads to question whether there is a universal approach to designing for children's theatre as opposed to other types of theatre due to the age of the intended audience. Children's theatre also has its own unique style that is stereotypically portrayed through bright rainbow colors, larger than life objects, and over exaggerated storybook elements. This is evident in common productions like The Cat in the Hat and The Wizard of Oz where the design elements of color, size, and balance are boldly utilized. Many artists belittle these overemphasized elements for being cute, cartoonish, and nonsensical. However, according to research gathered from professional scenic designer's experiences, designer publications, and current children's theatre productions, there is significance in these certain design elements. They immerse the young audience into the show's story by appealing specifically to a child's aesthetics. To understand a child's aesthetics, a designer must first have some knowledge of a child's cognitive development. From there, a designer can emphasize elements that he or she knows will resonate with the child audience in a way that enhances the growth of the child's imagination. Certain design elements will be more successful than others in evoking a response from a child audience though. Thus, to successfully design scenic elements for children's theatre, an approach that emphasizes color, size, and balance is necessary in order to create a positive and nurturing effect on a child audience.

419 3:30 pm Perception vs Entertainment Domonique Evans, Musical Theatre (M)

The purpose of this research is to explore the history and continued racist representation of the African American community by the entertainment industry, and the impact that it has on youth in urban areas. I will be examining minstrel shows and blackface in the 19th and 20th centuries. I will also be examining how urban youth have no representation in classic Disney films, and only have rap and hip hop artists and culture to emulate and aspire to. In addition, I will demonstrate how Hamilton: An American Musical is setting an example of how rap and hip hop is a positive influence to youth culture in urban areas. Upon completion, the hope is to raise awareness of the perception of the African American community, and how it is being portrayed on stage and screen does not reflect the actual culture as it exists and how it existed over history. The intellectual stigma is that the perception of African American culture does not match the reality and shouldn't be defined by stereotypes on and off the stage.

420 3:45 pm

Wearable Technology and Theatrical Story Telling Beatrice Collins, Costume Design and Technology (M)

With the ever growing advancements in technology and its influence on society today, the art world is constantly in the race to keep up. Theater is a prime example of this. From scenery, projections, sounds, and lighting, these separate areas are all adopting and utilizing the latest technologies. Costumes however, seem very slow to utilize new technologies, such as LEDs. Throughout my career as a costume designer, I have noticed that technologies like LEDs are only used to add technology to a show for technology's. There does not seem to be a thought about the character or how the technology could advance the story the costume is trying to tell. There has also been a hesitation to incorporate technology because of the negative stigmas that lie with it. When researching the use of LED lighting, arduino boards, or 3D printing in costumes, it was also difficult to find too much conversations happening about it. The purpose of my paper and my research was to address the need for conversation about technology in costume design and to also speak to how technology can and has been used throughout history to develop a character. By using historical research dating back to the 1800s to the present, I speak as to how costume designers have used electrical lighting in costumes to add to the spectacle. I also speak about recent productions, such as The Wiz and A Midsummer Night's Dream, and their uses of modern technologies: LEDs and fiber optics. Everywhere one looks in our society, technology is being used. And yet, with technology becoming so fundamental in our society, costume design still feels hesitant to include it. In researching this topic, I hope to find out more as to why it is seen so negatively and also to explore and highlight how it can actually be advantageous given the right play.

421 4:00 pm

Fantasizing Homoeroticism in *Naruto Live Spectacle* (2015): Cross-gender Casting as Buffer for Male Homoerotic Tension in Stage Performance of Japanese Manga Yi-Lin Chung, Theatre Arts (M)

This essay investigates the selective cross-gender casting in manga-based stage play *Naruto Live Spectacle* (2015), which cast two actresses cross-dressing to play male characters with notable homoerotic qualities. This particular casting choice highlights the ambivalent attitude toward homosexuality and homoeroticism in Japanese anime/manga culture, in which homoerotic content is both profitable and taboo. The creators are compelled to recreate homoerotic moments in the original manga onstage, because a significant section of the fanbase is attracted by the implication of romantic and sexual relationship between male characters. However, performance of homoeroticism is at odds with the values of the general audience and social-political climate at large, inviting potential criticism and financial fallout. As a strategic compromise,

actresses are hired to 'play pretend' male characters as one half of a homoerotic duo with male costars, countering the 'fantasy' homoeroticism with real life heterosexuality. In this micro-ecology Japanese manga/anime performance culture, selective cross-gender casting acts as a buffer to lessen the intensity of homoerotic tension, while still allowing the production to perform homoerotic content—compromising between conflicting demands of different audience demographics to achieve optimal reception and commercial success in the performance sphere of manga/anime culture.

Session D-8

Oral Presentation: Behavioral & Social Sciences OR8 Friday, 3:00, March 3, 2017 Location: Legacy Suites

422 3:00 pm

Lay-perceptions of Happiness: A Cross-cultural Comparison between India and the United States Jessica Johnson, Psychology (U)

Happiness is a human condition that has long been sought after, yet a universal objective understanding of the concept has eluded mankind. A review of past literature reveals that Eastern and Western civilizations' interpretations are in opposition. Western societies emphasize the attainment of pleasure and personal achievement, while Eastern societies favor social relationships and balance. This study, designed from a grounded theory perspective, used qualitative research methods to understand the variation in perceptions of happiness among lay-people in India compared with those in the United States.

In-depth face-to-face interviews and a demographic survey were conducted with 56 participants from various cities in India and United States. The interviews examined participants' physical and cognitive understanding of happiness. All Interviews were recorded and transcribed. In India, some interviews were conducted through a translator due to language barriers. As a result of convenience sampling, most participants were college-aged, but the sample included demographic variability within socioeconomic status, religious affiliations, and gender association.

Content analysis of interview data identified major cultural and demographic themes within 5 dimensions: (1) definitions and attributions, (2) frequency, (3) physiological experience, (4) future predictions, and (5) past experiences. Both cultural groups had similar patterns in their definitions (contentment and satisfaction) and associations (social relationships) with the concept of happiness. Similar patterns were found in frequency of experiences, although all participants struggled to quantify those experiences. Past experiences and future predictions were analyzed utilizing measures of long-term and short-term orientations. Both groups reported that social relationships were the cause of their most salient past experiences in both orientations, but differences were found in the types of relationships reported. Major cultural differences were found in participants' future predictions in both orientations, either within their answers or their motivations.

The findings indicate that there may be an approximate universality in environmental contributions to an individual's happiness, but that culture plays a substantial role in individuals' understanding and subsequent application of that understanding to pursue happiness within their own lives. Further research is proposed to explore these possibilities.

423 3:15 pm

Open Source Intelligence: Monitoring Violence in Tijuana through the News

Andrew Hill, International Security and Conflict Resolution (U)

My research catalogs the incidence of violent crime in Tijuana, Mexico utilizing solely open source intelligence (OSI) sources. Special effort has been made to identify the type of crime, victim and perpetrator data where available, what types of weapons were used, if any, identifying any potential links to organized crime, as well as introduce geographic information systems into the analysis.

This research tracks and identifies what types of violence happens where in Tijuana. Such information is essential in tracking, monitoring, and understanding trends in violence, especially in regards to and within the context of trans-national criminal organizations, specifically drug and human trafficking between the San Diego-Tijuana corridor.

Preliminary analysis indicates that open source intelligence captures a significant portion of violence that occurs in Tijuana when compared to official figures released by Mexican, American, or non-governmental sources, as well as providing more information regarding kind or type of violence and location. OSI is an effective and efficient form of intelligence gathering in the context of understanding the human costs of trans-national crime organization activity in Tijuana, Mexico, and results suggest that similar methodology may be applicable to other violent cities.

424 3:30 pm

The Connection of Insurgency Group's Participation in Drug Operations with Increased Violence As a Result of Greed: the Case of Colombia

Sarah Gruenewald, International Security and Conflict Resolution (U)

Colombia has endured a long civil conflict for the past century and although the violence has decreased in recent years, a peace agreement between the government and the guerrilla groups has not yet been successful. Multiple factors are related to the initial cause of the civil war such as weak state capacity, oppression, and government corruption, but throughout the twentieth century the involvement of the drug trade has increased and intensified the levels of violence in the country and has made efforts towards a solution more difficult. Originally driven by grievance and the desire for justice and equality, the financial support from drug trafficking has mobilized paramilitaries and guerrilla group motives towards greed which has increased and intensified violence by these groups.

In this paper, I discuss the nature of the Colombian Civil War and it's participating actors. I will touch on the production and distribution of cocaine and the relationship of it's monetary effects with the guerrilla groups, specifically the Revolutionary Armed Forces of Colombia or FARC, government officials, and civilians using qualitative and quantitative data. First, I will provide the historical background of Colombia that considers political opposition patterns and inequalities between the two parties leading to the formation of guerrilla groups, paramilitaries, and the escalation of the drug industry. Then I examine the introduction of the cocaine trade to the querrilla groups and paramilitaries, how it strengthened them, why resistance remained absent and why there was a transition from grievance to greed. In the end, I will discuss how my findings support my argument that the transition in the FARC's motives from grievance to greed precipitates increased levels of violence in relation with the drug trade.

425 3:45 pm

Difrasismo: Creativity and Metapoetic Space in Classical Náhuatl Metaphor

Jose Renteria, Latin American Studies (M)

This paper analyzes Classical Náhuatl difrasismo, a complex type of metaphor, from a linguistic anthropological and historical perspective. It assesses the historical linguistic phenomenon through recent scholarly interpretations that evaluate the socio-cultural features of metaphorical understanding (i.e., conceptual metaphor). In order grasp the classical sense of this literary device, the research limits its scope to pre-contact (pre-1519) and sixteenth century metaphors derived from Náhuatl literary sources. The historical focus restricts the language evolution factor of the Náhuatl language while emphasizing the socio-cultural influences that played a role in literary/performative productions of metaphor and difrasismo during the classical phase of the language. By highlighting key features of the conceptual metaphor theory, the analysis suggests that indigenous creativity of difrasismo exposes an unidentified domain (metapoetic space) of in xochitl in cuicatl (flower and song) "poetry" as a performative domain, which may have corresponded with additional conceived metaphysical realms. Although mapping the Classical Náhuatl understanding of in xochitl in cuicatl as a performative space presents various difficulties, the research also proposes that the sophistication of ritual performative realms increased as individual Nahua singer/ poets spiritually and consciously placed themselves in sacred metaphysical locations. Finally, the application of blending models of conceptual integration provides a plausible illustration of how difrasismo operated as a unique, extended metaphoric concept through sanctioned socio-cultural roles of poets and sages in Nahua religious worldview.

426 4:00 pm

Application of the Risk Environment Framework to Understand Prevalence and Correlates of Substance Use among HIV-Positive Latinos in the Tijuana-San Diego Region Nicole Pepper, Interdisciplinary Research on

Substance Use (D)

Substance use among persons living with HIV has been linked to poor treatment adherence and can undermine optimal health outcomes, as well as pose a transmission risk to drug and sex partners. This secondary data analysis explored differences in type (i.e. drug of choice) and method (injection versus non-injection) of substance use, as well as delayed entry to care, among HIV-positive Latinos living in San Diego and Tijuana. We applied the Risk Environment Framework proposed by Rhodes to better understand and contextualize substance use and health risk in a binational population. We examined the prevalence and correlates of substance use in this population. Convenience sampling was used to conduct interviewer-administered surveys with HIV-positive adult men and women (N=201) recruited from HIV clinics and service agencies in Tijuana (N=101) and San Diego (N=100). Bivariate analysis was used to compare substance use and entry to care by site. Logistic regression was used to identify and model participant predisposing characteristics (e.g., substance use) in the context of the risk environment in which substance availability exists. Self-reported outcome variables were days from HIV diagnosis to entry to care, type of substance used and method of use. Nearly 70% of participants reported lifetime substance use. Nearly a third (31%) had been incarcerated and almost 20% had been deported. Differences emerged by recruitment site; significantly more Mexico-recruited participants endorsed heroin use (p=0.001) and injection drug use (p=0.005) than U.S.-recruited participants. Individuals recruited from the U.S. were significantly more likely to report use of poppers (p=0.012) than participants recruited in Mexico. Although substance use history is common in this binational population, most participants reported taking antiretrovirals and overall timely entry into care. Findings lend support for a harm reduction approach to further support care engagement among substance users. Better understanding of the environments in which individuals use drugs can provide crucial information for intervention and policy development. Further research is needed to better understand ongoing substance use problems to inform regional policies and interventions that may be needed for largely shared populations. Collaborative, binational approaches are needed to improve regional HIV care outcomes and reduce transmission risk.

Session D-9

Poster Presentation: Behavioral & Social Sciences P9 **Friday, March 3, 2017, 2:15 pm** Location: Montezuma Hall

427 2:15 pm

Relationship between Job Satisfaction and Bullying at a Multinational Level Julie Ton-Vuong, Psychology (U)

Bullying in the workplace is a concern to employees worldwide. Previous research has shown bullying to be a widespread phenomenon. Furthermore, it has been linked to both job related and health related outcomes such as symptoms of post-traumatic stress, anxiety, depression, burnout, increased intentions to leave, and reduced job satisfaction and organizational commitment. Some buffers and predictors have been associated with bullying as well, such as, perceived organizational support, constructive leadership, and autonomy. Although much research has been conducted investigating the buffers, predictors and outcomes of bullying, little research has been conducted of a multinational nature. In this study, we examined the relationship between bullying and job satisfaction (JS) in each of 34 European countries. We use archival data from the European Working Conditions Survey of 2010 to compare this relationship between different countries. Results show that there was an inverse relationship between bullying and job satisfaction in each country, Correlations ranged between -.058 to -.255. The relationship was statistically significant in each of these countries. Thus, there is a consistent negative effect of bullying on job satisfaction when investigated in a multinational sample. Further research is needed to identify the moderators of this relationship.

428 2:15 pm

Moderators of the Relationship between Coworker Gender Similarity and Job Satisfaction

Joyce Hwang, Industrial-Organizational Psychology (M)

Demographic similarity is the similarity between an employee and his or her peers on a particular demographic characteristic. Research on demographic similarity has suggested that individuals tend to favor similar others. Gender similarity is a salient form of demographic similarity within work environments that influences individuals' experience at work. In this research, we examined the extent to which gender similarity was related to individuals' job satisfaction, and the extent to which gender-related characteristics, including gender personal identity and sex roles (femininity and masculinity), moderated that relationship. We hypothesized that gender similarity would be more strongly related to job satisfaction for individuals high in gender personal identity. In addition, we hypothesized that job satisfaction would be lowest for individuals whose levels of femininity or masculinity were not in alignment with the gender makeup of their workplace. To test the hypothesis, we utilized archival survey data from 658 employed SDSU students. Based on moderated regression analyses, there was some support for our hypotheses. The results showed that women with high gender personal identity were more satisfied in a workplace with higher numbers of men, and men with high gender personal identity were less satisfied when they were in a workplace with higher numbers of women. The results also showed that women with low femininity were less satisfied at work when they worked in an environment with higher numbers of women. In addition, men with low femininity were less satisfied when they were within a workplace with more women and more satisfied in a workplace with more men, and men with high femininity were more satisfied in a workplace with more women and less satisfied in a workplace with more men. We also examined masculinity as a moderating variable, but found no evidence of its effect on the relationship between gender similarity, gender, and job satisfaction. The findings provide evidence that the effects of gender similarity on job satisfaction vary depending on a variety of characteristics. This study has implications for organizations and understanding how their gender demographics influence employees' experiences at work.

429 2:15 pm

The Interaction of Sexual Orientation and Race in Predicting Men's Income Thuan Nguyen, Sociology (M)

Since the 1990s, there has been a growing body of literature examining the sexual orientation wage gap; however, only a few studies examine the intersection of sexual orientation and race in predicting income. This study applies an intersectional framework to understand how sexual orientation and race predicts men's income while controlling for other determinant factors. This study uses a 2015 dataset from the Integrated Health Interview Series (IHIS), a nationally representative sample of non-institutionalized adults in the United States, and applies Ordinary Least Squares (OLS) to estimate a series of multivariate regression models. Based on findings from previous studies, I predicted that gay men earn less than heterosexual men regardless of race. In regards to race, I predicted that Hispanics earn less than Whites, Blacks earn the least out of all racial groups, and the aggregate racial group "Other" (i.e. Asians, Pacific Islanders, Native Americans, etc.) earn the most. I also predicted that the interaction between sexual orientation and race would reveal that non-heterosexual racial minority men experience a greater wage penalty. With a sample of 8,410 men, all four regression models show that age, years of education, white collar occupations, and marital status have a positive relationship on men's income. In regards to race, all four regression models show that income differences were statistically significant for Blacks and Hispanics, with Hispanics

earning less than Whites, and Blacks earning the least out of all racial groups. Results for sexual orientation show that gay men earn more than heterosexual men; however, this is statistically significant in only one model. Lastly, results show that the interaction between sexual orientation and race are not statistically significant. Overall, the interaction between sexual orientation and race was not significant in predicting men's income.

430 2:15 pm

The Effects of Supervisor Behavior on Individual Workplace Outcomes: A Multilevel Exploration of Personal and Contextual Mediators

Noelle Devlin, Industrial/Organizational Psychology (M)

Professions in healthcare are susceptible to negative effects of work-related stress and conflict in their roles due to the rapidly changing environment and numerous sources of influence they are exposed to. This is particularly true for those in nursing. Although much research has explored many work outcomes of clinical nurses, much less is known about nurse leaders, and how a supervisor's behavior can affect individual level outcomes within nursing units. Furthermore, nurse leaders are the recipients of role conflict and stress because they must balance supporting the nurses they supervise, while also meeting the goals of the hospital and upper management needs. Thus, role conflict and stress have been found to be associated with a number of negative individual level outcomes in the workplace such as lower job satisfaction, higher turnover, and higher work-family conflict. In contrast, when nurse leaders are given more responsibility and feel their opinions are valued in the organization, many positive individual level outcomes are observed. It is salient to understand how supervisor behaviors can affect these individual outcomes. The aim of this study was to examine whether the cross-level effects of unit level unsupportive supervisor behaviors on job satisfaction, turnover, and work-family conflict were mediated by role conflict and stress at the individual level. Additionally, this study explored whether the cross-level effects of unit level supportive supervisor behaviors on job satisfaction, turnover, and work-family conflict were mediated by organizational voice and participation in decision-making at the unit level. In the present study, data was collected from 34 hospitals, resulting in survey responses from 503 nurse managers. The survey contained questions related to workplace stress and perceptions of supervisor behaviors. Scores were aggregated to capture perceptions of the hospital units as a whole in addition to individual level responses. Multilevel path analysis was utilized to explore study hypotheses. The results indicated that role conflict, but not stress, mediated the relationship between unsupportive supervisor behaviors and the individual outcomes. In addition, both organizational voice and participation in decision-making were found to mediate supportive supervisor behaviors and the individual outcomes. Implications of the findings will be discussed.

Student Research Symposium 2017

431 2:15 pm

Predictors of Followers' Preferences For Authoritarian Leadership

Saige Riley, Industrial and Organizational Psychology (M)

In the workplace, almost all positions include workers acting in the role of a follower. Having an understanding of followers' preferences for specific leadership styles has significant implications for how employees interact with their superiors, which can impact their individual performance as well as the performance of their work group. One understudied style of leadership is authoritarian leadership; although most people may react negatively to such leadership, others may be more positively disposed towards authoritarian leaders. Therefore, the goal of the present study was to examine various predictors of preferences for authoritarian leaders.

We studied predictors from three domains: personality, beliefs about followers, and past experiences with authoritarian leadership. It was hypothesized higher levels of docility and passiveness, lower levels of proactivity, more passive beliefs about followers, and higher levels of past experience with authoritarian leaders would be associated with higher levels of preferences for authoritarian leadership.

Data were collected data from 297 college students who were employed at the time of the study. Sixty-four percent of participants were female. The average age was 19.18 years (SD=1.63) and average work experience was 2.18 years (SD=2.10). We conducted a regression analysis controlling for participant gender and work experience. The results indicate that docility and past experience with authoritarian leaders had statistically significant and positive relationships with preference for authoritarian leadership.

This research indicates that personality and past experience are more important for understanding preference for authoritarian leadership than beliefs about followers. Organizations and individuals may both benefit from this research by better understanding which individuals are more responsive to certain leadership styles, and thus which leaders may be the best fit to lead certain individuals or teams.

Session D-10

Poster Presentation: Physical & Mathematical P4 **Friday, March 3, 2017, 2:15 pm** Location: Montezuma Hall

432 2:15 pm

Synthesis and Structural Characterization of Spider Silk Mini Spidroin Peptide Mimics Mahsa Pahlavanneshan, Chemistry (M)

Spiders can spin up to six different types of silk that have a diverse range of mechanical properties and typically outperform

most, if not all man-made materials. Dragline spider silk (major ampullate) fibers are comprised of two proteins, major ampullate spidroin 1 and 2 (MaSp1 and 2). These spider silk proteins generally have a highly repetitive core sequence consisting of certain consensus motifs, mainly Poly(Ala), Poly(Gly-Ala), Poly(Gly-Gly-X) and Gly-Pro-Gly-X-X. This study is focused on synthesizing and characterizing the GAG(A)5GAG peptide which is the region that forms the spider silk's b-sheet core and hypothesized to impart spider silk its remarkable strength. The peptide is being synthesized using a Liberty Blue Automated Microwave Peptide Synthesizer, purified using reverse phase High Performance Liquid Chromatography (HPLC), and structurally characterized with Matrix Assisted Laser Desorption Ionization Mass Spectrometry (MALDI-MS) and solution Nuclear Magnetic Resonance (NMR) spectroscopy. Attempts are also being made by our research team to assemble the mini spidroin peptide mimics into fibers that resemble native spider silks.

433 2:15 pm

Modeling the Transition Between Lytic and Lysogenic Behavior in a Bacteria-Phage System Emily Jasien, Applied Mathematics (M)

Phages are viruses that infect bacteria and exploit the bacteria's internal mechanisms in order to replicate. Phages can follow two replication pathways: lytic or lysogenic. In the lytic pathway, the phage forces the bacteria to make copies of viral particles until the bacteria bursts, releasing the phage's progeny into the environment. In the lysogenic pathway a phage integrates its genome into the host, and, as the bacteria replicates, it passes along the phage genome to its daughter cells; depending on environmental events, the integrated genome will eventually enter the lytic pathway. Environmental systems can be dominated by phages exhibiting lytic or lysogenic behavior, and a system can also transition between the two. This transition and the causes that initiate it are not very well understood, but the impact can be quite extreme. For example, it has been observed that the transition of phages from lytic behavior to lysogenic behavior in c

Oral reefs correlates with the reef's degradation. We create a four-dimensional dynamical system in which there are four populations: sensitive bacteria, which are able to be infected by phages, virulent phages, which can only exhibit lytic behavior, lysogens, which are bacteria containing phage DNA, and temperate phages, which are able to choose between lytic and lysogenic behavior. We study this model using standard techniques from the theory of dynamical systems in order to better understand the transition between the lytic and lysogenic lifestyle and the factors that may cause it. Using this model, we are able to recover environmental observed viral-to-microbe ratios when temperate phages choose to exhibit lytic behavior. When temperate phages choose to exhibit lytic behavior the model recovers the piggy-back-the winner dynamics, in which lysogens overtake the system as the nutrients in the system increases. While we fully understand this model when it recovers the two scenarios in question, our current research is focused on how to capture a gradual transition between the lytic and lysogenic dominated systems.

434 2:15 pm

A Bayesian Approach to Multiple Testing of Equality in Binary Data for Crossover Trials Subashini Sudarsan, Public Health- Biometry (M)

In clinical trials, the crossover design is widely used to assess the treatment effects. However, it is not convenient to run a complete set of treatment sequences when there are four or more treatments under comparison. Many times, the scenario is associated with small sample size and limited information. This imposes challenges since many marginal cell observations are small or even zero. In this paper, we propose a Bavesian multiple testing approach to simultaneously evaluate the equality of several treatment effects. The proposed Bayesian approach has the advantage over the current frequentist approach in that it does not suffer from the constraint of small value of cell observations. We illustrate the approach using a simulation study and a real data example. When similar approach was used for testing equality in two treatment crossover design, consistent and reliable results even for small data samples were obtained. In the current experiment, this approach is extended to four or more treatments in crossover designs.

435 2:15 pm

Effect of Added Bases on the Redox-Responsive Dimerization of a 4 H-Bond Array containing a Phenylenediamine Redox Couple

Katrina Vuong, Chemistry (M)

Ureidopyrimidinone (UPy) derivatives, introduced by Meijer and co-workers, can form dimers linked by four strong H-bonds. Their relatively high association constants make them useful for forming supramolecular polymers, which can autonomously self-repair. This presentation shows the result of substituting a UPy with a N,N - dimethyl-p-phenylenediamine and therefore adding a redox reactive dimension to self-repair.

Cyclic voltammetry (CV) of UPyH in CH2Cl2 at slower scan rates shows two reversible redox waves. The first wave is of one electron height, corresponding to a two-electron transfer per dimer. At a higher oxidation potential, the second oxidation wave is one half the height of the first and then on the return scan, a slightly more negative potential is needed for reduction. At faster scan rates, the second wave becomes irreversible. Also, at faster scan rates, a new reduction wave appears at a more negative potential than the reduction wave for the first electron transfer process.

Our best explanation of this CV behavior is that the second oxidation wave corresponds with a second e- transfer per redox center. Each urea-phenylenediamine N-H site in the dimer then becomes acidic enough to transfer its proton to the carbonyl oxygen on the UPyH isocytosine. This changes the favorable binding motif of DDAA to a weaker binding motif of ADAD, resulting in partial break up of the dimer. Proton transfer from the doubly oxidized monomer to the dimethyl amino group on a fully reduced dimer completes the break up and renders the fully reduced dimer electroinactive, explaining the half wave height. Thus, the overall reaction corresponds to break up of half the dimers, with two electron oxidation and deprotonation of each monomer to give two UPy+. However, the other half of the UPy's remain dimerized in the protonated form as (HUPyH+)2. The goal of the current study is to find an external base that will allow full oxidation and break up of all the UPyH dimers, while retaining the chemical reversibility of the overall reaction. To this end, the CV behavior of UPyH is being studied in the presence of substituted pyridines of different basicity.

436 2:15 pm

A Total Chemical Synthesis of Micromide Nicholas Hernandez, Biology (U)

Micromide is a novel lipopolypeptide isolated from the Symploca genus of cyanobacteria in Hawaii. Micromide is composed of five N-methylated amino acids with a modified thiazol tail piece and a B-methoxyhexanoic acid head piece. This secondary metabolite shows cytotoxicity of IC50 in pico-molar concentrations against KB cells. The structure of the product proposed by Williams et. al is suspected to be incorrect1 because the chiral amino acids are subjected to acid hydrolysis during the peptides characterization. The Bergdahl group strives to propose an effective synthesis for micromide in which the true structure may be elucidated. Our presentation suggests a route to the peptide using solidphase peptide synthesis and F-moc protected amino acids. N-Me-Phe-L-Fmoc is dissolved in DCM/DMF and coupled to CTC resin using DIPEA. Subsequent deprotection using 20% piperidine in DMF affords the free amine which is reacted with the next amino acid. This general procedure is replicated to grow the peptide as follows: Phe-Ile-Val-Val-Phe. The C-termal is then coupled to 3- methoxyhexanoic acid using DIC in DMF. This peptide is then removed from the resin using 20% HFIP in DCM. Next the N-Me-thiazol is coupled to the N-terminus of the molecule using HATU and DIPEA to yield the product. Using enantiomers of the amino acids present in microcmide in our synthesis we can construct various epimers of micromide and compare them to the proposed structure of the natural product using 1H NMR. Once the structure has been corrected micromide will be produced in a significant amount for biological testing to determine its biochemical efficacy.

437 2:15 pm

Surface Waves over Arbitrary Vorticity Profiles Robert Insley, Computational Science (D)

The purpose of this project is to simulate the effects of large numbers of point vortices on free fluid surfaces. To accomplish this, we couple vortex methods, which are based on the vorticity equation and the Biot-Savart law, to the Unified Transform Method and the Dirichlet-to-Neumann operator, thus providing a novel formulation through which to perform computations of the fluid flow. This method is ultimately formulated in terms of vortex coordinates and surface variables, and compares far favorably to less-efficient methods that have to keep track of entire vector fields. The ability to calculate the behavior of elaborate underwater vortex groupings opens doors to new research. For example, it could be used to examine the effects of underwater eddies on passing tsunamis, or to model the transport of substances in water (such as pollutants) by vortices.

Session D-11

Poster Presentation: Engineering & Computer Science P6 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

438 2:15 pm

Flapping Unmanned Aerial Systems Enrico Santarpia, Aerospace Engineering (D)

Insects present excellent flight performance and are the ideal candidate for bio-inspired flapping unmanned aerial system (FUAS). An effective design of FUAS will try to reproduce the essential aspects of the insects biological features required for efficient flight with focus on the maximization of the payload and minimization of the power required to flap the wings. In previous studies it has been shown that to achieve a high efficiency of flight the wing must not be rigid. The main goal of this effort is to understand the physics of low-Reynolds flight to mimic the exceptional abilities of biological flyers and do even better than them: artificial unmanned systems do not have biological constraints...

439 2:15 pm

San Diego State University Water Tunnel Carlos Mendoza, Aerospace Engineering (U)

This project proposes the final wrap-up of the construction, assembly, and shakedown testing for the San Diego State University Water Tunnel. Currently, SDSU's fluid mechanic laboratory capabilities are limited due to available equipment. This Water Tunnel will be used to introduce advanced lab exercises to engineering students studying fluid mechanics, and to provide a unique research facility to the University to carry out research projects in turbulence, unsteady fluid dynamics, fluid-structure interactions and cavitation. During this final phase of the project, we will be using PIV (Particle Image Velocimetry) to document the flow dynamic properties, i.e., the quality of the freestream flow field generated by this facility in the test section, so as to fulfill the certification requirement for the facility before its commitment to service in education and research. In order to carry out the PIV measurements, optical setup, which is a necessary fundamental part of the shakedown testing, is needed for the project.

This pressurized tunnel has a capacity of 700 gallons of water with a test section of $5^{\circ}x4^{\circ}$ and a flow rate of 660 gallons per minute. In addition to this, the water tunnel will consist of newly implemented optics and mirrors to acclimate with Professor Xiaofeng Liu's ground-breaking research in the growing fields of turbulence and cavitation.

The water tunnel will be equipped with state-of-the-art time-resolved PIV, i.e., particle image velocimetry systems, which can provide nonintrusive planar or 3-D flow field diagnostic capabilities for velocity and pressure measurements in a variety of research projects related to turbulence, unsteady aerodynamics and cavitation research. The design and construction of the water tunnel facility will not only enable the establishment of advanced flow diagnostic capabilities at SDSU, but also lay a solid foundation to attract research funding from government agencies, such as NSF, ONR, AFOSR and NASA, and local and national companies. Extensive research activities in fluid dynamics boosted by the erection of this unique water tunnel will provide plenty of research opportunities to both graduate and undergraduate students in the college of engineering so as to enhance their professional competence before their graduation.

440 2:15 pm

Impact of Internal Forced Air Cooling on Radiative Absorption of a Gas-Particle Medium in a Small Particle Solar Receiver

James O'Hara, Mechanical Engineering (M)

A high output solar receiver utilizing a specifically developed infrared-absorbing, air-particle mixture as the working fluid is being developed for a power plant. Solar radiation, redirected and focused by a heliostat field is concentrated into the receiver and absorbed by a "black" air particle mixture with flows through the receiver. The exiting mixture, now superheated, serves as the input to a gas turbine in a Brayton power cycle. Current efforts pertain to cooling of the receiver window as high levels of incident radiation heat the window directly through absorption within the glass and indirectly as the participating air-particle gas mixture serves to heat the internal face of the window beyond the material limits. The solution to lowering the operating temperature of the receiver window without sacrificing power level and system performance is to internally cool the internal surface of the window with jets of air. The cooling air mixes with the gas-particle mixture and has the effect of changing the optical path through the receiver by temporarily displacing, and impacting the density uniformity of the absorbing medium in the receiver, thus lowering the total mass of "black" particles that are exposed to incident radiation. This has a direct impact on the absorption of the working fluid for a given mass flow and therefore impacts system efficiency. Computational fluid dynamics coupled with a radiation simulation is employed to predict the impact of the forced-air convection on different aspects: effectiveness of window cooling, change in optical path length within the absorbing air-particle medium, and overall receiver efficiency. Transient effects are also studied.

441 2:15 pm

An Experimental Evaluation of a Solar Simulator And Solar Receiver

Robert Newcomb, Mechanical Engineering (M)

The Small Particle Heat Exchange Receiver, SPHER, is a high-temperature concentrating solar power system that utilizes carbon nanoparticles as an absorption medium to produce air at temperatures of up to 1100 °C. The full-scale SPHER's primary function is to take heat from the sun and use it as the primary heat source in a combined Rankine-Brayton cycle to produce electrical power. While extensive analysis and design has been done on creating the SPHER in the Combustion and Solar Energy Laboratory at San Diego State University, there is much to be explored experimentally. Further investigations into the performance and modification of the SPHER have been undertaken in this research. Comparisons have been made between thermal and fluid dynamics models of the SPHER and the experimental results seen in the testing. Several components to the existing lab scale SPHER in the C&SE Laboratory have been tested, and new equipment such as a new high quality infrared camera has been utilized in the evaluation of thermal performance of the SPHER. Several additions to enhance heat transfer and thermal efficiency have been added to both the carbon particle generator and the SPHER supply. The newly implemented flow path of the carbon-air mixture has been examined to ensure that optimal thermal distribution has been achieved in the solar absorber cavity. Additional modifications to the solar simulator facility have also been undertaken; including lenses to refract the light from the solar simulator producing a wider half-angle and shorter focal length. The solar simulator facility is likewise evaluated in terms of spectral output, and modifications have been made to test the effect of cloud transience on the spectral output and solar receiver performance.

442 2:15 pm

Flames... out of this world

Luca Carmignani, Mechanical and Aerospace Engineering (D)

The behavior of flames in microgravity has been studied for the last few decades, to improve the fundamental knowledge of combustion processes and create a relatively safe environment for astronauts. The evolution of flames over thin solid fuels burning with an opposing flow velocity between 0 and 50 cm/s (typical of ventilation systems) depends on many factors, such as fuel composition, thickness, oxygen concentration, magnitude of the opposing flow and so on. Flame spread rate – speed of the flame along the spreading direction – is an overall property that characterizes the flame behavior. Experimental values and their variations due to external factors such as oxygen level and opposing flow velocity are reported and compared. Results are obtained processing videos of the experiments with a MATLAB code we developed, called Flame Image Analyzer Tool (FIAT). The distance from the flame leading edge to the end of the flame (flame length) is calculated from the experiments, and the trend for different conditions agrees

with computational results obtained with a CFD code coupled with a radiation code, written by Dr. Bhattacharjee. Experiments were conducted in the Microgravity Science Glovebox on the International Space Station, using thin sheets of acrylic material (PMMA). Fuel thickness, sample width, flow velocity, and the oxygen level were varied in these experiments. Also, flames burning in similar conditions but different sample width change significantly in dimensions, color and curvature of the leading edge, suggesting a three-dimensional nature of the process.

443 2:15 pm

A Frequency Channel Allocation Algorithm for Creating a Network of Wireless FDD Nodes Moein Parsinia, Computational Science (D)

Many Frequency Division Duplex (FDD) systems operate on a fixed uplink and down link frequency bands where the downlink channel is used for the transmission of data from the node and an uplink is used for reception of data. Systems consisting of these nodes are designed for point to point (P2P) links in a single hope operation. In order to use these nodes in a multi-hop wireless network, these frequency channel assignment should be carried out carefully, such that the network is robust to the node mobility and meet the traffic/ application demands.

In this research, we will present our channel assignment scheme so that the operation of these nodes can be extended to the multi-hop network topology. Our algorithm assumes multibeam antenna at each node and establishes a link connection such that each node can talk to multiple neighbors at a time. This design is robust to the node mobility and interference, and significantly enhances the throughput performance of the entire network.

Session D-12

Poster Presentation: Behavioral & Social Sciences P10 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

444 2:15 pm

The Insidious and Elusive Nature of the Adoption and Safe Families Act and Its Impact on Black Mothers

Zakkiyya West, Political Science and Africana Studies (U)

The current rise in imprisonment of Black mothers and the separation of their children can be traced to three periods of history: the enslavement period, the creation of women reformatories in 1870, and the War on Drugs during the 1980s. These periods support the belief that Black women are highly devalued in American society and are historically viewed as deviant mothers who should neither bare nor keep custody of

their children. The federal government's enactment of the 1997 Adoption and Safe Families Act (ASFA) issued "unintended consequences" against former imprisoned African-American mothers in their attempts to regain custody of their children. The ASFA's insidious and elusive design purposely allotted for state intrusion into the lives of Black families, allowing states to terminate the parental rights of African-American mothers at a greater rate than white mothers. There has been little research conducted on whether mothers are properly informed about ASFA and its true impacts on families and the obstacles Black mothers encounter upon release. Due to the lack of knowledge about ASFA and its implications, upon release from prison, Black women are locked into a battle against state courts only to begin the Termination of Parental proceedings. The present research will examine the intersection between the lawyers, child protection services, state's correctional system and the court's role in permanently separating African-American families. A qualitative study based on unstructured, in-depth interviews with 5-10 former inmates who are African-American mothers, reflecting the emotional trauma they experienced during the process of attempting to regain custody of their children. The hypothesized results will show that through their current accounts, the mothers were not well-informed about ASFA and therefore, received little to no help from lawyers, family, or the state in fighting for their children.

445 2:15 pm

Monkeys in our Backyard: Developing effective signage to encourage a positive human-monkey interface in Florida

Bridget Rickman, Sustainability (U)

The study of primates living in a non-native habitat presents an interesting context in which to examine the interface between non-human primates and their human counterparts. One such context is Silver Springs State Park, Florida, U.S. where a population of rhesus macaques (Macaca mulatta) lives. Native to Asia, the founding members of this population were introduced by humans in the 1930s to enhance tourism along the Silver River. Previous research has determined that these macaques have ecologically adapted to their location by obtaining a majority of their diet from native vegetation. However, they have also learned that the river's edge provides opportunities to gain provisioned food from boaters and other park visitors. The macaque's presence at the river, in turn, results in people moving in closer proximity to them, thereby increasing the risk of physical contact and disease transmission. Despite these concerns, there is little to no information provided to visitors on how to best interface with the macaques. To fill this gap, our objective was to create informational signage that is informed by previous empirical research on effective message framing in contexts analogous to the Silver River. To do so, we conducted extensive reviews of the literature on the following topics: the effective and ineffective messages used by state and national parks in eliciting certain behaviors or prohibiting behaviors, the psychological components that frame how people are

best persuaded, and why people choose to participate in conservation efforts, or not. We found that using concise and positive language that informs of what to do and why (e.g., "avoid feeding, it causes fighting") rather than the negative tone of what not to do (e.g., "don't feed the animals") produces the most desirable behaviors from humans. Based on our research and in coordination with park management, we created a 18"x24" poster design with three key guidelines for people to follow when they encounter the macaques: 1) "Feeding causes fighting" 2) "Give them space" and 3) "Observe only". It is our hope that this type of signage will minimize interaction and encourage people to appreciate the monkeys from a distance.

446 2:15 pm

Roadside monkeys: The impact of provisioning on moor macaque (Macaca maura) ranging patterns in Bantimurung-Bulusaraung National Park, Sulawesi, Indonesia

Joshua Trinidad, Biology (emphasis on Zoology) (U)

The study of primates in anthropogenic environments has become exponentially critical in recent decades. Many primate species are becoming increasingly threatened with extinction and in order to reduce these effects it is necessary to understand their adaptability to a given anthropogenic environment. Our research focused on how a recent behavioral shift exhibited by a group of habituated moor macagues (Macaca maura) in Bantimurung-Bulusaraung National Park, Sulawesi, Indonesia has affected their spatial usage. This behavioral shift involves the group spending many hours of the day along the provincial road, which bisects the park and their original home range, where they wait for motorists to toss them food (e.g., fruit, vegetables, packaged goods, etc.). We compared spatial use data collected before the shift (in 2010 and 2011) with data collected after the shift (2016) to assess changes in ranging patterns (i.e., home range size and daily path length). The spatial location of the group was recorded every 30 min during 6-hour behavioral observation blocks using a Garmin 60Csx (2010 and 2011) and a Garmin MAP 64s (2016). We analyzed the spatial data from dry season months (June -July in 2010, 2011 and September – October 2016) in ArcGIS v. 10.3 and Geospatial Modeling Environment (GME). We used the minimum convex polygon (MCP) tool to calculate home range size and the Kernel Density Estimation (KDE) tool to generate core areas for the group in each year. We generated daily path lengths by using the points-to-line tool for each individual day per time period. Our preliminary results confirm that the group shifted its core area to more frequently use space close to the road. We also found an increase in home range size (21.26 ha in 2010 and 27.83 ha in 2011 compared to (40.7 ha in 2016). Our results indicate that provisioning at the site is contributing to changes in habitat use that could negatively affect the group's ability to maintain access to its original core area (where wild resources are abundant) and increase the likelihood of injury from motorists; outcomes with negative implications for the long-term conservation of this Endangered primate.

447 2:15 pm

Incarceration Effects on Social Mobility Denise Hernandez, Sociology (M)

Millions of people are currently incarcerated in the US, and a historical look at incarceration rates suggests they will only continue to increase. Incarceration reproduces racial and social disparities in the labor market, generational family transmission of inequality, and health outcomes via unequal sentencing across race; Latinxs and African Americans are imprisoned for drug crimes at higher rates than Whites, even though higher rates of white substance abuse are reported (Wakefield and Uggen 2010). My paper uses the 2012 General Social Survey to examine two questions: 1) What is the impact of a previous incarceration on a respondent's income? And 2) Does the impact of incarceration on income vary by race/ethnicity? I estimated a series of step-wise Ordinary Least Squares regression models which sequentially added demographic measures, measures of economic resources in childhood and parental SES, respondent's SES, neighborhood segregation, and interactions between incarceration and race/ethnicity. Results suggest that previous incarceration is associated with an approximately \$13,700 penalty controlling for demographic measures; accounting for other parental, individual, and neighborhood characteristics reduces this penalty to approximately \$9,000. Interaction estimates suggest that race/ ethnic minorities face larger penalties, but these estimates do not attain statistical significance. Data limitations and future directions are discussed.

448 2:15 pm

Examining burials from two Formative Period communities within the lower Rio Verde Valley, Oaxaca Aaron Young, Anthropology (M)

The lower Rio Verde Valley of Oaxaca, Mexico has produced copious amounts of archaeological sites as well as a number of burials. The Early Formative period (1600 - 850 BCE) shows the earliest human settlement, which intensifies immensely during the Late Formative period (300 BCE - CE 250). A bioarchaeological analysis of Cerro de la Virgen (150 BCE - CE 500), which was first excavated in 2005 and most recently in 2016, is discussed here with comparisons to the site of Rio Viejo (300 BCE - CE 250). Both sites were occupied during overlapping time periods. However, the sites differ in their functions within the lower Rio Verde Valley communities. Rio Viejo is considered to be the region's centralized polity and main political authority, whereas Cerro de la Virgen is a secondary center, and a periphery community. To date, excavations of Cerro de la Virgen have produced four individuals with varying degrees of preservation, representing both primary interments and offerings. The most complete individual shows signs of extensive dental wear and oral pathology. Through a comprehensive bioarchaeological analysis, we compare these individuals to individuals from the Terminal Formative period

excavated at the site of Rio Viejo. The soil in much of the lower Rio Verde Valley consists of heavy clay sediment which adheres to bone and can distort or obstruct certain boney features, and affect overall preservation; making analysis of burials from this period and important endeavor in documenting the biological history of the region.

Session D-13

Poster: Biological & Agricultural Sciences P5 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

449 2:15 pm

The Effect of Habitat Restoration on the Diversity and Abundance of Insect Pollinators **Kristi Baker, Biology with emphasis in Ecology (U)**

Native habitats have been degraded or completely lost within California. Since habitat loss poses a serious threat to the persistence of native plant and animal species, millions of dollars annually are spent on habitat restoration efforts. Otay tarplant (Deinandra conjugens) is a native and endangered species that has been the subject of recent restoration efforts. To determine if habitat restoration efforts are beneficial to pollinators, we compared the presence and abundance of insect pollinators between native and nonnative vegetation communities at two sites in San Diego County where restoration for the Otay tarplant had occurred. At Rice Canyon Park, we compared pollinators within tarplant and black mustard (Brassica nigra) flowering patches, and compared tarplant and a non-native grassland (Bromus sp.) at Rancho Jamul Ecological Reserve. Insects were sampled using blue, yellow, and white cup traps in native Otay tarplant patches and nearby non-native plant communities. All collected insect specimens were identified to quantify diversity and abundance of each species. Plant preference of pollinators was determined based on the location the specimen was collected. In general, pollinator communities differed between Otay tarplant and non-native plants (black mustard and a non-native grassland) with different taxa responding differently to each vegetation type. Within the Apidae family, the European honey bee (Apis mellifera) preferred mustard flowers while a native bee, Anthophorula torticornis, preferred Otay tarplant flowers. The Melissoides tessellata, however, showed a preference of non-native grassland. Those bees in the family Halictidae also differed in plant preference. Equal counts of Lasioglossum microepoides were found in the Otay tarplant patch and a non-native grassland. Halictus tripartitus and Agapostemon sp. were more numerous in the non-native grassland. Since genera within the same family displayed varying preference between Otay tarplant and non-native grasslands, order and family level taxonomy is not detailed enough to detect trends in pollinator habitat preferences. Our data shows that the

presence of non-native plants can draw pollinators away from native plants. With some pollinators displaying a preference for non-native plants, habitat restoration may decrease pollinator exposure to non-native plants and increase pollination of native plant species.

450 2:15 pm

Plant Community Composition Determines Sediment Ammonium Levels In Two Southern California Salt Marshes

Wendi White, Biology (U)

Salt marshes provide a habitat for wildlife, control shoreline erosion, improve water quality, and sequester atmospheric carbon. The functioning of marsh ecosystems depends critically on sediment biogeochemistry. For example, although plants can change the concentration and composition of nutrients in marsh sediment, little is understood about how plant species composition influences nutrients in marshes. To address this gap in our understanding, we examined the influence of monospecific stands and mixed-species assemblages of two dominant marsh plants, Spartina foliosa (cordgrass) and Salicornia virginica (pickleweed), on nutrient levels in two southern California salt marshes. All plots initially contained a mixed assemblage of these two species. From these, monospecific stands were created by removing neighbors (either cordgrass or pickleweed) from plots. No plants were removed from mixed-species plots. From each plot, we measured the ammonium levels of sediment porewater collected from multiple time points during the growing season. Plots containing cordgrass, either with or without neighboring plant species, had similar and low ammonium levels. However, pickleweed-only plots had nearly double the ammonium levels. Together, these data suggest that cordgrass populations within our plot were associated with lower ammonium levels regardless of the presence of neighboring plant species. We hypothesize that cordgrass more effectively utilized ammonium because it grew rapidly within our plots during the experiment. Pickleweed, in contrast, displayed negligible growth. Although cordgrass may preferentially utilize ammonium as a nitrogen source when compared to pickleweed, our emerging data do not support this hypothesis. Given the importance of cordgrass with respect to marsh functioning, understanding ammonium levels may drive the ability of salt marshes to provide their ecosystem services.

451 2:15 pm

The Impact of Climate Change on Pollinator Communities and Flowering Plants

Lauren Lopez, Biology (U)

Climate change can affect the mutualistic interaction between flowering plants and their corresponding pollinator communities. Most plants rely on insect pollinators to facilitate reproduction by physically transferring pollen from the stamen of one flower to the stigma of another flower. Without this

pollination process, these plants would be incapable of producing offspring and would eventually go extinct. This study focused on the interactions between Otay tarplant (Deinandra conjugens), an endangered plant endemic to San Diego County, and its corresponding pollinators as it relates to a change in climate (temperature and precipitation). To sample potential pollinators, cup traps were set out in fields of Otay tarplant at Rice Canyon Park and Rancho Jamul Ecological Reserve (San Diego County) during the blooming period in 2015 and 2016. All insect samples were identified to quantify the diversity and abundance of each potential pollinator species associated with Otay tarplant. There was a difference in timing of flowering between 2015 and 2016, with flowering occurring about four weeks earlier in 2015. The most commonly collected taxa included Coleoptera (Melyridae), Hymenoptera (Andrenidae, Apidae, Halictidae, Megachilidae), Diptera (Anthomyiidae, Sarcophageidae, Synneuridae, Tachinidae), and Lepidoptera (moths). For some insect groups, there was evidence of a phenological mismatch in the flowering period and peak abundance of these pollinator species, likely due to differing annual temperatures. For other insect groups, their peak densities were more synchronized with the flowering period in both years. Without proper pollination, the already endangered Otay tarplant populations may continue to decline until they go extinct. Thus, understanding climate change and its effects on our environment may be the key to conserving species diversity. More studies can be conducted in the subsequent years to provide a more thorough analysis of the long-term effect of annual temperature changes.

452 2:15 pm

Using metagenomics to characterize floral visitation-driven metabolic signatures of nectar microbes

Natalie Frixione, Biology (U)

Plant-pollinator interactions can be influenced by microbial (bacteria, micro-fungi, and yeasts) composition of floral nectar, as the chemical components (sugars, amino acids, secondary metabolites) of nectar can be altered by microbial taxa present. Because pollinators and other floral visitors exhibit preferences for specific nectar chemistry microbial presence and metabolic activity in floral nectar has the potential to influence floral pollination. Previous studies have described functions of floral nectar microbes by inferring function from taxonomic annotations. Our study provides an explicit description of the functional capacity of floral-nectar associated microbes with a metagenomic investigation of the microbial community in nectar of a flowering shrub, Epilobium canum. E. canum is primarily hummingbird-pollinated, and visited by nectar-robbing carpenter bees who diminish nectar resources without pollinating them. The objective for this study was to determine the microbial communities dispersed in E. canum nectar by floral visitors, and describe the functional capacity of these microbes. In this study, we collected replicate nectar samples from E. canum flowers, extracted DNA from the nectar, and used next-generation sequencing to investigate

the composition of microbes. In total, we sequenced 20 metagenomes comprising four visitation treatments: 1) no visitation, 2) pollinated only, 3) robbed only, and 4) pollinated + robbed. The number of reads per metagenome ranged from 191,481 to 2,064,977, averaging 1,129,671 reads. The metagenomes were uploaded to the MG-RAST server for annotation to known databases. Based on preliminary results which suggest the diversity of microbial taxa present in floral nectar is altered when the flower has been visited compared to non-visited flowers, we hypothesize that we will find unique functional signatures across our four visitation treatments. We are currently exploring specific gene pathways within the metagenomes related to sugar metabolisms, such as sucrose, fructose, and glucose pathways. With this investigation we hope to better understand if different floral visitors are depositing a different suite of microbes in floral nectar, and if these microbes have the functional potential to alter nectar chemical composition.

453 2:15 pm Phylogeny of the Teiid Genus *Aspidoscelis* **Steven Byrum, Biology (U)**

Lizards of the family Teiidae (tegus and whiptails) are a diverse group of squamate reptiles. With their abundance and conspicuous foraging behavior, teiids are relatively easy to locate and have thus been widely studied in biological research. Because of the great interest in these lizards, evolutionary biologists have attempted to gain a better understanding of phylogenetic relationships within the family; however, many phylogenetic studies have been hindered by lack of sufficient data and/or limited taxon sampling. Within the Teiidae is the genus Aspidoscelis, with over 40 species found across North and Central America, with high diversity in the arid parts of western North America. Aspidoscelis is notable for containing both unisexual and bisexual species. A recent study involved a phylogenetic analysis by Tucker et al. (2016) that used DNA sequence data from 56 different teild species to determine the intergeneric relationships between taxa. However, Tucker et al. only used one species of Aspidoscelis to represent the entire genus, underlying the fact that many teild species known while relatively few were sampled. The purpose of my study is to evaluate the phylogenetic relationships within the diverse genus Aspidoscelis, as well as determine divergence dates for lineages within Aspidoscelis. Mitochondrial DNA sequences were used to create a dataset using 41 Aspidoscelis taxa, representing all three species groups and multiple species and subspecies from within the species groups. Phylogenetic analysis of these data using Bayesian inference methods confirms many previously suggested relationships. The monophyly of each of the three bisexual species groups (deppii, sexlineata, and tigris groups) is strongly supported. The Mexican deppii group is strongly supported as the sister

group to all remaining *Aspidoscelis*. Within the tigris group, the placement of *A. marmorata* is not well supported, being weakly placed as sister to the southern Baja California subgroup of species. The sexlineata group has two strongly supported basal subgroups: One containing *A. sexlineata* and the *A. inornata* complex, with the Baja California *A. labialis* being the sister species to these two previous subgroups. The other major clade within the sexlineata group includes the majority of the species diversity within the group.

454 2:15 pm

Comparison of Survey Data for Owl Population in the Imperial County Abigain Quintero, Mathematics as a Single

Subject Teaching (U)

Agriculture plays one of the most important roles in the Imperial Valley economy and the distribution of water is huge for agriculture production. Irrigation canals and drains are found almost anywhere throughout the Imperial Valley, most as part of the Imperial Irrigation District (IID) rights-of-way and service areas. This is important because the Imperial Vallev holds almost 70% of the population of Western Burrowing Owl in California and many burrowing owls have found these canals, drains and even ditches as a good place to build their habitats. Nevertheless the burrowing owl is a California Department of Fish and Game (CDFG) Species of Special Concern and has been included on the 2007 revised list of Special Concern due to its decline in population for the last years. If the Burrowing Owl becomes listed as an Endangered Species in the United States or even in California, extreme measures of protection will be taken by the CDFG affecting the activities of IID and farmers around these service areas, and thus affecting the distribution of water towards many places, including agricultural fields.

To track owl populations over time, biologists must complete surveys around areas where the Burrowing Owls reside. However, the protocol mandated by the Staff Report of the Department of Fish and Game, created in 1995, does not fulfill the conditions of the Imperial Valley. Because of this, a new survey protocol has been in beta testing since 2014 in solar fields and construction sites where owl burrows have been found, after using the old method in 2010-2012.

Our objective is to use data provided by biologist Marie Barrett to localized areas where the burrow owls reside, as well as analyze how the population of owls has increased or decreased in the last couple of years in these areas. This will also help to conclude how effective the new survey protocol is compared to the one created by CDFG in 1995.

Session D-14

Poster Presentation: Behavioral & Social Sciences P11 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

455 2:15 pm

How Vocabulary Supports Lexical Processing in Young Bilinguals

Lauren Thayer, Psychology (U)

Previous work has demonstrated a significant correlation between vocabulary size and lexical processing in monolinguals (e.g., Fernald, Swingley, & Pinto, 2001). However, it is unknown whether this extends to bilingual children learning two languages simultaneously. In addition, it is unknown whether the link between vocabulary size and lexical processing is language-specific or supported by general language ability. The present study investigates whether there are distinct lexical-semantic networks for each language or a shared language system at 18 months of age.

Participants (N = 22, M age =18;12, range = 17;15 – 20;21) were bilingual Spanish-English toddlers. Receptive vocabulary in each language was reported by parents on the MacArthur Bates Communicative Development Inventory (MCDI, Fenson et al., 1993). A modified Intermodal Preferential Looking Paradigm assessed lexical-semantic priming (Arias-Trejo & Plunkett, 2009). Children saw target and distractor image pairs across two conditions: preceded by a word (prime) semantically Unrelated or Related to the target. Primes were presented in both languages.

First, we examined whether vocabulary size in English (model 1) or Spanish (model 2) predicted Proportion Looks to the Target, with Language (L1 or L2), Prime Pair (Cross- or Within-language), and Trial Type (Related or Unrelated) as additional factors. There was a significant main effect of Trial Type (F(1, 7) = 6.80, p = .035), but no effect of English or Spanish vocabulary size, respectively.

Next, we examined whether total conceptual vocabulary (model 1) and number of known translation equivalents (TE, model 2) predicted Proportion Looks to the Target, with Language (L1 or L2), Prime Pair (Cross- or Within-language priming), and Trial Type (Related or Unrelated) as additional factors. Results revealed a significant total conceptual vocabulary X Trial Type interaction (F(1, 7) = 10.41, p = .015) and TE X Trial Type interaction (F(1, 7) = 9.59, p = .017). No other effects were significant.

These results reveal that word knowledge across languages (such as total conceptual vocabulary and TE's), rather than language-specific knowledge, predicts lexical processing. Together these findings point to a shared lexical network that supports the link between vocabulary size and lexical access.

456 2:15 pm

Translation Equivalents and Code-Switching in Bilingual Preschoolers

Alyssa Campos, Speech Language & Hearing Sciences (U)

Two unique features of bilingual language development are translation equivalents and code-switching. Translation equivalents (TE) are words with the same referent across languages. Code-switching (CS) is alternation between languages when speaking. It is unknown how these features change with development. This study aims to describe the development of these features between 16 and 39 months of age in Spanish-English bilingual children.

Children were tested longitudinally at 16, 22, 29, and 36 months of age. Expressive vocabulary size was measured using the MacArthur-Bates Communicative Development Inventory (MCDI) from 16 to 29 months. CS was assessed from language samples (in English and Spanish) during parent and child free-play at 29 and 36 months.

We assessed the relation between TEs and CS through visual scatterplot inspection. Finding no relation, we asked whether the number of TEs in children's expressive vocabulary changed over time. An ANOVA with TEs as the dependent variable and age as the predictor revealed a significant effect of age (F(2, 83)=30.05, <.001, $\eta^2_{\,\rm p}$ =.42)(Figure 2).

Next, we evaluated CS as a function of language and age. An ANOVA with CS as a dependent variable and Age and Language (English and Spanish) as predictors revealed a significant main effect of Language (F(1, 107)=21.08, p<.001, $\eta^2_{\ p}$ =.17) and a marginal Age x Language interaction (F(1, 107)=3.14, p=.08, $\eta^2_{\ p}$ =.03 suggesting that CS is expressed differently across the child's two languages.

Finally, owing to a small sample, we explored the role of language dominance on CS using visual inspection: English-dominant children decreased their Spanish use when speaking English from 28 to 36 months. Conversely, Spanish-dominant children increased their English use when speaking Spanish over the same period (see Figure 1).

Together, these findings suggest that children's knowledge of TEs increases rapidly from 16 to 29 months and is unrelated to CS. Rather their use of CS seems to be influenced by language dominance. That is, Spanish-dominant bilinguals increased their use of their weaker language (English) with age whereas English-dominant bilinguals decreased their use of their weaker language (Spanish). In sum, children tend to gravitate towards the majority language despite the status of their dominant language.

457 2:15 pm

The Influence of Repeated Exposure on Word Recognition

Chanel Konja, Speech Language and Hearing Sciences (U)

Typically developing school-aged children have the extraordinary ability to acquire new words by using surrounding linguistic information to infer a word's meaning. Through the processes of encoding familiar verbal information (newly encountered words), children are able to later successfully recall these learned words. This incredible process is the primary source of grade school word learning and is essential for vocabulary growth from grade school onward. This study focuses on how children are able to recall a set of words which have no meaning (nonsense words) following a priming task which mimics the process of word learning through context.

Participants included typically developing school-aged children with no known history of significant neurological issues. The study included a cognitive and language assessment battery, a word learning task (Experiment 1), and a word recognition task (Experiment 2). After completion of the cognitive language battery, participants completed a word learning from context task in which they listened to naturally presented sentence triplets, each ending with a target nonsense word. After each presentation, participants were then asked to identify the nonsense word's meaning, if possible. Lastly, during the word recognition task, participants completed a word recognition task in which they listened to nonsense words one by one. After each presentation of a single nonsense word, participants were asked to indicate whether they remember hearing the word from Experiment 1 (familiar) or they don't remember hearing the word (unfamiliar).

We expect that after the participants are given the task of assigning meaning to a nonsense word, by using its surrounding contextual cues (Experiment 1), participants will have more success in recognizing that word (Experiment 2) compared to either the nonsense word they could not assign meaning to in Experiment 1 or a randomly interspersed novel nonsense word that was not introduced in Experiment 1. Furthermore, we expect that participants will be successful in distinguishing both the learned nonsense word they had assigned meaning to in Experiment 1 and the nonsense word they had not assigned meaning to that was presented in Experiment 1 from the novel nonsense word that was not introduced in Experiment 1.

458 2:15 pm

Time-course of lexical activation of verbs during sentence processing

Valeria Garcia, Speech Language and Hearing Sciences (U)

There is a wealth of data in the literature supporting the fact that when hearing a sentence, listeners immediately activate representations of the nouns they encounter (Love, 2008). These findings are supported through the use of methods that

tap in to the on-line ('unconscious') processing of sentences which are sensitive to more ephemeral aspects of language processing, thus not requiring conscious reflection. Through these methods, researchers have mapped the time course of noun activation, allowing for the development of models of lexical access and sentence processing and, by extension, a better understanding of how these processes are disrupted secondary to neural trauma that results in language impairment, i.e., aphasia.

Unfortunately, the studies described above have been limited to the investigation of nouns within the sentences. We have little information about the time course of verb activation during ongoing sentence comprehension. This is a glaring omission in the field as it is well accepted that verbs are key elements of sentences that determine the relationship between sentence components (Shapiro et al, 1993). In sentences, verbs require participants to determine who is doing what to whom. Verbs can have differing numbers of participants, lending some to be more complex than others (Shapiro, 1997).

The current study focuses on mapping the time course of verb activation during sentence comprehension by testing verbs with different complexities; intransitive and obligatory transitive. As shown in the examples below, collapsed [1] is a one-place, intransitive verb; its only participant is the agent (the nurse) who is performing the action. In contrast, disturbed [2] is a two-place transitive verb that requires both an agent (the man) and a theme, or direct object (the large group). 1. The nurse collapsed. 2. The man disturbed the large group. Here, we investigated the time course of activation of verbs with different complexities to see if (1) they follow a similar time course to noun activations and (2) to explore whether complexity results in differing time courses in unimpaired individuals (n=70). A cross modal lexical priming task (Swinney et al, 1979) was employed using sentences such as [3] and [4] below to examine verb activation at three distinct time points throughout the sentence (noted by the *): The nurse collapsed*1 on the cold floor*2 during the risky operation*3 at the hospital. The man disturbed*1 the large group*2 in the medical library*3 despite the "please be quiet" sign. Our results were clear. For intransitive verbs [3], we found priming at the offset of the verb (*1) indicating immediate activation of the verb's lexical representation. This pattern was different for the transitive verbs [4] where priming was not found until after the offset of the theme, or direct object (*2).

These results provide insight into the real time processing of verbs and the role that argument structure has during ongoing sentence processing. We argue that in processing sentences, lexical/semantic properties of verbs are not accessed until all arguments are identified. The next step is to test individuals with aphasia to see if these patterns hold, which would indicate that accessing the syntactic properties of verbs are unimpaired in this language-impaired population.

459 2:15 pm

Acquisition of Complex Clusters in L2 Phonology Makayla Davis, Speech Language Pathology (M)

This study evaluates the acquisition of complex syllable structures of adult Mandarin speakers learning English as a second language. In English, the structure of syllables follow the universal rules of the Sonority Sequencing Principle (Clements, 1990; Gierut & Champion, 1999). This principle indicates that least sonorous sounds begin and end syllables, whereas the middle contains the most sonorous sound, similar to a bell curve. The sequencing of consonants within a cluster effect sonority. Clusters with smaller sonority distances (e.g. /fl-/) are more marked, or more difficult to pronounce, in comparison to larger sonority distances (e.g. /tr-/). Unlike English, Mandarin lacks word-initial and final consonant clusters (e.g., /pl-/, "plan"; /-nd/, "band") and Mandarin word-initial consonant-glide sequences are represented as one sound (Duanmu, 2007).

Eighteen Mandarin-speaking students from the American Language Institute (ALI) ranging from 17-27 years old (15 female, 2 male, and 1 unspecified) volunteered. Most participants were Mandarin-monolinguals with no English exposure until after 6 years of age. Recorded speech samples were collected by administering a 200 single-word probe containing complex syllable structures. Participants were shown pictures and then asked to name the object depicted. Responses were phonetically transcribed to determine target consonant cluster accuracy and error patterns.

Analysis indicated devoicing as the most frequent cluster error (18/18 participants), which involves changing a voiced consonant to voiceless ("pigz" \rightarrow "pigs"). This increases the sonority distance between the consonants in a word-final cluster, making it less marked. The second recurring error was cluster reduction, where participants deleted the more sonorous consonant, word-final /// ("salt" \rightarrow "sot"; 17/18 participants). Another error included vowel epenthesis, the insertion of a vowel not previously present ("plate" \rightarrow "p-uh-late; 16/18 participants). The structure is simplified by separating the cluster into two less marked syllables.

Variation in phonological patterns of consonant cluster production may suggest cross-linguistic phonological influences of an individual's native language on a second language, such as Mandarin impacting English. These results will not only contribute to the area of phonological acquisition and markedness of syllable structure, but also has implications for language pedagogy, accent modification, and speech-language clinical services.

Session D-15

Poster Presentation: Engineering & Computer Science P7 Friday, March 3, 2017, 2:15 pm Location: Montezuma Hall

460 2:15 pm

Fluorescence approach to determining photochemical degradation rates of oil in seawater Madeleine McConnell, Mechanical Engineering (U)

Industrial oil spills severely affect different ecosystems around the world. Extensive research has been conducted in order to understand the harmful effects of heavy crude oil in different environments, but there is still much we do not know. NOAA scientists have made predictive models of oil spill degradation that account for microbial degradation, but the degradation due to sunlight-induced processes, such as photo-oxidation, is lacking. There is also much to learn about how natural seep heavy crude oil differs from industrial heavy crude oil. An experiment was conducted to evaluate the degradation of oil to compare the effects of sunlight on natural oil and industrial oil to help identify differences between the two using a fluorescence spectrophotometer to track the degradation rates over time. The results of this study show that the industrial oil dissolved in water at a much higher rate than the natural seep oil, and showed a higher degradation rate when exposed to light. This analysis can inform predictive modeling to eventually show how long oil will remain in the ocean and how natural seep oil differs from processed heavy crude oil.

461 2:15 pm

Understanding the impacts of vegetation on post-fire evapotranspiration in the San Bernardino Mountains, California

Fahmy Attar, Environmental Engineering (U)

Evapotranspiration (ET) is an important aspect of the hydrological cycle that transports water from soil through evaporation and vegetation through transpiration to the atmosphere. ET is a complex process to estimate, but is an important variable in hydrologic modeling. ET is influenced by the interactions between the land surface, vegetation, and the atmosphere. Wildfires have the potential to significantly alter the physical characteristics of a watershed, which can further impact ET by altering vegetation type and structure. This research uses a Classification and Assessment with Landsat of Visible Ecological Groupings (CalVEG) from the United States Department of Agriculture (USDA) Forest Service. The data has a spatial resolution of 30 square meters and is derived from Landsat satellite imagery and high resolution (0.5 square meter) SPOT (Satellite Pour l'Observation de la Terre). CALVEG is a classification system that defines vegetation types and characteristics in California such as tree and shrub canopy cover and tree stem diameters and will be used to understand the relationship between vegetation types and ET in San Bernardino Mountains after the 2003 Old Fire. Observed vegetation types include mixed Conifer, Big Cone Douglas, mixed Chaparral, and Canyon Live Oak. This work will analyze the spatial diversity of vegetation types and incorporate the Operational Simplified Surface Energy Balance (SSEBop) ET product to understand the influence of wildfire and vegetation type on evaporative processes. The study will form the basis for understanding the impact of the vegetation types on post-fire evapotranspiration and ultimately contribute to improve hydrological estimates in the region.

462 2:15 pm

Role of Clay Content on the Strength of Polymer-Bound Sand

Tasneem Sadeque, Civil Engineering (U)

The current study examines the effect of clay content on the strength of sand specimens bonded by polyethylene powder. The mixture is heated to soften the polymer, then cooled to harden the polymer and thus bond the soil grains. Results from tests conducted with a modified point-load testing method indicate that (1) strength increases with clay content up to 1% and then decreases, and (2) in general, the strength is lower for water-submerged specimens than for dry ones.

463 2:15 pm

Evaluating changes to snow-covered area after forest fires in the Pacific Northwest Phillip Patague, Civil Engineering (M)

Mountain snowmelt supports a billion people worldwide, and in the mountains themselves, snowmelt provides soil moisture late into the melt season. The last several decades have been marked by distinct increases in large-wildfire frequency across the western United States. Post-fire soil and vegetation changes, including a reduction in forest canopy, result in altered hydrologic response as well as long-term changes in energy and water budgets. Canopy reduction due to wildfire is hypothesized to significantly alter snowpack properties, snowmelt response, and snowpack energy balance. This includes increased exposure of snow-covered area to radiation, decreased snow albedo due to surface alterations from char, and changes in soil temperature and moisture. This study focuses on observing changes in snow-covered area for burned watersheds within the Pacific Northwest Region. Preliminary work utilizes remote sensing products such as albedo, burn severity, snow covered area, grain size, and vegetation. Understanding the spatial and temp.

Oral patterns of post-fire snow processes will inform future efforts to couple surface and energy balances with hydrologic modeling in regions that may undergo more frequent and larger wildfires. The methods and models developed from this work can provide information about affected snowmelt quantity and timing to water resource managers and policymakers in the Pacific Northwest Region.

464 2:15 pm

Effect of burn severity on dissolve organic carbon levels in disturbed watersheds after the Roblar Fire **Auvid Mirhosseini, Civil Engineering (M)**

Wildfires are a common in Mediterranean ecosystems such as southern Californian. The natural occurrence of wildfires can impact the water quality of the disturbed watersheds. Wildfires can release large quantities of organic carbon into the immediate environment that eventually enter local hydrology. After a wildfire, a fraction of dissolved organic carbon (DOC) can enter surface water through surface runoff and soil leaching, which can vary spatially and temporally. This research will determine the correlation between wildfire burn severity and the degradation of DOC levels in watersheds burned in the 2016 Roblar Fire in Camp Pendleton, San Diego, California. First, this study analyzes soil samples collected after the fire and focuses on the variability of DOC by degree of burn severity (unburned, low, moderate, and high). Second, soil samples are burned in a controlled, laboratory setting to imitate fire conditions and provide a strong foundation for future wildfire replication studies. The controlled study will indicate specifically how fire temperature and burn duration directly alters the DOC level. This research is highly relevant in light of increasing wildfire frequency. This work provides a basis for the effect of wildfire on water quality and may inform water source selection and water treatment procedures.

465 2:15 pm

Spatial and temporal evapotranspiration patterns following wildfires in semi-arid regions of United States

Patrick Poon, Civil Engineering - Water Resources (M)

The composition and processes of forest systems are influenced by natural and anthropogenic disturbances, leading to alterations of spatial and temporal patterns of the hydrological cycle in both short and long term periods. Due to the observed increase of intensity, frequency, and duration of wildfires, there are extensive studies that focus on post-fire hydrological responses. However, efforts to understand post-fire evapotranspiration (ET), a water-energy flux that distributes water from land surface to the atmosphere, is minimal. This gap in the post-fire literature arises from the complex interactions between soil, vegetation, and atmospheric parameters. This research, therefore, aims to investigate post-fire ET trends in southwest semi-arid systems following two major wildfires: the Las Conchas Fire (2011) in New Mexico and the Old Fire in California (2003). Operational Simplified Surface Energy Balance Actual Evapotranspiration model

(SSEBop ETa) is coupled with soil burn severity and shows changes in both seasonal and annual patterns. After the Las Conchas Fire, annual ETa is lower in high (103 – 352 mm), moderate (97-303 mm), and low (91-268 mm) soil burn severity areas. Ongoing research includes incorporating additional remotely sensed datasets such as enhanced vegetation index (EVI), vegetation type, albedo, and land surface temperature, to further understand and improve post-fire ET estimates in various forest and chaparral systems. As wildfires are increasing, this research can provide information to improve post-fire hydrologic predictions that can ultimately be applied to other topics of concern such as water quality degradation, biochemical processes alterations, and downstream augmented runoff and erosion.

Session D-16

Poster Presentation: Behavioral & Social Sciences P12

Friday, March 3, 2017, 2:15 pm

Location: Montezuma Hall

466 2:15 pm

Patient, provider and system level factors to consider when implementing evidence based CRC cancer prevention & early detection in a FQHC lasmine Carey. Interdisciplinary Studies (II)

Jasmine Carey, Interdisciplinary Studies (U)

Background: Colorectal cancer (CRC) is the third leading cause of cancer death in both men and women in the United States. Regular CRC screening reduces CRC mortality by decreasing the incidence of disease and by increasing the likelihood of survival. The most common barriers to CRC screening adherence are cost and lack of health insurance. Populations that are most likely to have lower screening rates include Hispanics/Latinos, immigrants, and those with limited English language proficiency.

Methods: The on-going study is a randomized controlled trial testing different strategies for boosting CRC screening in a Federally-Qualified Health Center. Participants are of 567 registered patients of San Ysidro Health Center, INC. (SYHC) Latino patients aged 50 to 75 and not currently up-to-date with CRC screening.

Prior to conducting the trial, feedback was obtained from patients, providers and administration level about factors to consider prior to conducting this study. Data were obtained from 33 patients in organized focus groups. Provider-level feedback was obtained through one-on-one meetings. Administrative/System level data was obtained from reviewing clinical protocols, study-related documents, materials and data processes (e.g., use of electronic health records for recruitment and data tracking, and referrals for abnormal CRC screenings). Results/Conclusion: Patients recommended adding the SYHC logo to study-related materials to promote trust and likelihood of a positive response from participants. Incorporating multiple CRC screening tests into study-related materials to accommodate provider CRC preferences was important. Finally, we discovered several data limitations in using electronic health records for research purposes and a need to develop a referral system for CRC abnormal screening for uninsured patients.

467 2:15 pm

Cultural Beliefs and Contextual Factors Affecting Cancer Treatment Choices at the US-Mexico Border Marisabel Coronado, Psychology (U)

The relationship between scientific and other explanatory systems is a central question for cognitive psychology. A common assumption is that scientific knowledge eventually replaces supernatural and other culture-specific beliefs (e.g., Piaget, 1954). A growing body of evidence, however, shows that this is not the case (Legare et al., 2012). The co-existence of seemingly incompatible belief systems is particularly common when people are thinking about illness, especially when confronted with a life-threatening disease such as cancer that resists any easy explanation or cure. Cognitive psychologists, however, tend to overlook the relationship between explanatory models and structural factors such as socioeconomic status and access to healthcare. As Dein (2004) points out, the distinction between what is cultural and what is socioeconomic is far from clear, particularly for minority groups. In the present study, we take a more dynamic approach by examining the cognitive and structural factors that affect healthcare beliefs and practices among individuals with cancer at the US-Mexico border. This population is particularly important to study as many structural as well as cultural factors may affect their treatment choices, including their mobility, poor social support. language barriers, and undocumented status. To examine these factors, we conducted semi-structured interviews with 5 individuals diagnosed with cancer residing in the Imperial Valley. We asked about their health status and treatment history and assessed their understanding of the causes of their illness and the efficacy of different treatments, including biomedical, behavioral, spiritual and folk remedies. We also collected data on a variety of demographic and structural factors, including SES, employment, mobility, education, and language skills. Our preliminary analysis revealed that participants endorsed a variety of explanatory models, including both biological (e.g., hereditary, contamination, physical trauma) and supernatural causes (e.g., susto, or fright, moral transgressions, and negative thoughts), supporting the co-existence hypothesis in cognitive psychology. Participants' responses, however, also highlighted the importance of structural factors in determining which types of treatment they ended up seeking. This work has important implications for the design of cancer prevention and treatment programs targeting this and other vulnerable populations.
468 2:15 pm

Pathways to Care for Latina/o Children with Cancer in Rural and Small Communities at the Border Jorge Cisneros, Psychology (U)

Despite pediatric cancer rates among Latina/o children that are similar to or exceed the rate among White children, little research is available on how Latina/o children enter the cancer care system, whether their parent/primary caregivers experience barriers in accessing this care, or the extent that they encounter barriers in the lengthy follow-up care that children who have recovered from cancer continue to need. For parents in rural and small communities at the U.S.- Mexico border, the impediments to obtaining cancer care for their children may be especially onerous. The objective of this exploratory study was to document the barriers to care on the part of Latina/o parents in rural and small town communities at the U.S.- Mexico border seeking medical care for their children who have cancer. Specifically investigated were patterns of parents experience of barriers in accessing this care, and their perception of the quality of cancer care. The extent of use of cancer care services for children in Mexico was also determined and parents' recommendations for improving care were investigated.

A total of 10 open-ended interviews of parents/primary caregivers of children diagnosed with cancer were completed. These interviews were recorded and then transcribed. Three to four research assistants collectively reviewed the transcribed interviews and identified major themes in them. This was done across interviews until it was clear that no new themes emerged. This set of 6 themes was applied to the remaining transcriptions with the use of NVivo, a qualitative data analysis program. The 5 identified themes were 1) distance from cancer care centers: 2) delay in initial referral to cancer care: 3) lack of services for children with cancer in Imperial County: 4) effect on families: 5) children's emotional and social experiences: and 6) personal growth through adversity. Finally, parents provided their recommendations for improvement of cancer care for children in Imperial County. Results may be useful in developing interventions to help families better and more quickly access pediatric cancer care in similar rural, border counties in other states.

469 2:15 pm

Gender Roles, Social Relationships, and Health: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study

Kinsey Pebley, Psychology (M)

Positive social relationships are associated with better outcomes across many mental and physical health conditions. Gender roles can influence social relationships by shaping behavioral expectations, and may also impact health (e.g., increased risk for alcohol abuse, HIV). *Machismo* and marianismo are traditional Hispanic/Latino gender roles for men and women, respectively, that could influence social relationships. Given the importance of relationships within Hispanic/Latino culture, examining the association between gender role beliefs and social relationships may be particularly relevant to understanding Hispanic/Latino health. We examined the associations of two components of machismo (traditional machismo and caballerismo) and five components of marianismo (family pillar, spiritual pillar, virtuosity/chastity, subordination to others, and self-silencing) with social relationship variables (perceived social support, family cohesion, and family conflict) associated with physical health in previous research. Participants (N= 5,313) completed questionnaires assessing traditional gender role beliefs and social relationship variables as part of the HCHS/ SOL Sociocultural Ancillary Study, a population-based cross-sectional study of Hispanic/Latino adults in four US cities. Analyses were age-standardized to the 2010 US population and weighted to account for design and sampling effects. Mean cohort age was 42.1 years (SE= 0.40), 51.5% had lived in the US for >10 years, 49.5% were married, 69.9% earned <\$30K per year, and 33% had traditional machismo (i.e., hypermasculinity) was associated with greater perceived social support among males (β = .097, p =.039, 95% CI [.020, .175]). In females, higher subordination (i.e., deference), was related to higher perceived social support (β = .176, p =.007, 95% CI [.068, .284]), while higher virtuosity/chastity related to lower family conflict (β = -.082, p =.003, 95% CI [-.127, -.037]). Contrary to our hypotheses, results indicate that gender role beliefs are not consistently associated with social relationships. However, some gender role components may have a greater influence on different aspects of relationships, and possibly health.

470 2:15 pm

Understanding the Experiences of Cancer Diagnosis and Coping: Perspectives of Rural Latino Cancer Patients on the USA-Mexico Border

Anastasia Beloshapko, Social Work (M)

The experience of a cancer diagnosis and treatment impacts every aspect of a patient's life. Its significance might be greater among rural cancer patients who have low socio-economic status and limited health care resources. Although coping with cancer is central to their cancer recovery and quality of life, there is a limited research on how underrepresented patients cope with psychosocial stressors. The current study aims to explore the experiences pertaining to cancer diagnosis and coping with psychosocial stressors among rural Latino cancer patients in USA-Mexico border region.

This qualitative study utilized a secondary data analysis. A convenience sample of patients diagnosed with cancer and treated at the rural cancer care organization located in Southern California along the US-Mexico border area was taken. The

data were collected June 2012-August 2013 by a trained research assistant who was bilingual (English/Spanish) and bicultural (USA/MEXICO). The semi-structured interview guide was used to conduct individual face-to-face interviews at the study site. The qualitative analytic approach utilized thematic analysis procedures. Study protocol was approved by IRB of San Diego State University.

The total of 22 participants included 12 females (54.5%) and the average age of the participants was 52 years. Most of the participants were Hispanics of Mexican origin (n = 20, 90.9 %). We identified five major themes in this study: (1) psychological distress, 2) cancer stigma, 3) acceptance 4) changes in life (positive & negative) and 5) coping -(a) family and friends support, (b) spirituality/religion, and (c) inner resilience. This study brings an in depth understanding of how individuals experience cancer diagnosis and cope with it when there is a lack of resources in the community. It is important for health care professionals to assess patients' needs and further assist them in developing and utilizing coping resources.

471 2:15 pm

Health Locus of Control Beliefs and Cancer Fatalism in the Deaf Community Marcelo Nieto, Public Health (M)

Contributing to these health disparities is the lack of use of American Sign Language (ASL) in the health sector, as this language barrier makes it difficult for many Deaf individuals to access healthcare resources. Health locus of control (HLC; the extent to which people believe they, or someone/thing controls their health), and cancer fatalism (the belief that when one has cancer, death is inevitable) have been shown to modify health behaviors (e.g., both internal HLC and low cancer fatalism have been associated with seeking treatment for health conditions). Few studies, however, have explored these constructs in the Deaf community, and it is unclear how more general HLC beliefs may relate to cancer-specific beliefs. In the present study, HLC domains and cancer fatalism were measured in Deaf adults, and the associations of these beliefs were examined.

Methods/Approach: Baseline data from three related randomized controlled trials with similar eligibility criteria were included in this study. Deaf community participants (N = 310) completed ASL versions of the Multidimensional Health Locus of Control (MHLC) scales and the Powe Fatalism Inventory (PFI). Bivariate correlational analyses of the PFI total score and the MHLC scales (internal, chance, powerful others, and God) were conducted to explore the relationship between HLC and fatalism.

Results: Cancer fatalism was found to be significantly positively related to chance locus of control (r = .527, p < 0.01), powerful others (r = .365, p < 0.01), and God locus of control (r = .377, p < 0.01), and significantly negatively related to internal locus of control (r = .120, p = .03). The correlations were strong for chance locus of control, moderate for powerful others and God locus of control, and weak for internal locus of control.

Conclusions: All four general domains of HLC are associated with fatalistic beliefs about cancer, although endorsement of chance as being a force in determining one's health was the most strongly associated with fatalism, and internal control was only weakly associated. Interestingly, Deaf participants were more fatalistic when they perceived that healthcare professionals would play an important role in whether they were sick or not. This may highlight the less than optimal experiences that Deaf adults have reported experiencing with the healthcare system.



Abstracts of Presentations

Session E-I



Session E-1

Poster: Engineering & Computer Science P8 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

472 4:00 pm

A Novel Water and Energy Saving Strategy – The Use of Secondary Effluent of Algal Biomass Cultivation

Daniel Delgado, Environmental Engineering (U)

Water and energy resources are inextricably linked. The collection, treatment, and transportation of water followed by the collection and treatment of wastewater requires a large quantity of energy. In California, for example, these actions account for about 20 percent of the electricity use and 30 percent of the non-power plant related natural gas use (California Energy Commission). Similarly, the energy sector is one of the largest users of water. The water requirements for biofuels production, i.e. feedstock cultivation, processing, and refining as well as conversion of extracted bioproducts to biofuels, are significantly higher than traditional fuels but biofuels potential benefits over fossil fuels make biofuels an attractive alternative. There are several benefits in the use of algal biofuels as a renewable energy source. Algae have a high potential yield per acre, ability to grow on land not suited for agriculture, and absorb carbon dioxide during growth. In using secondary effluent to grow algae, potable water is being conserved and the secondary effluent is being treated by the algae, removing some organic matter and nutrients like nitrogen and phosphate that can lead to algae blooms in surface waters. The goal of this research is to determine the feasibility of using secondary effluent for cultivation of algal biomass production and the benefit of using algae to purify secondary effluent to result in water and energy savings. To achieve this goal, the use of secondary effluent was investigated for cultivation of algal biomass. The secondary effluent was analyzed before and after the algae growth phase, consisting of thirty-one days, to measure the algae's purification capacity. Finally, the lipids were extracted from the algae grown in secondary effluent and compared against a control for analyzing of lipid yield. Preliminary runs have shown a significant removal of total nitrogen and a greater lipid yield for algae grown in secondary effluent over algae grown in the Miracle Gro control.

473 4:00 pm

Hydrologic Modeling of Alvarado Creek using HEC-HMS

Kyler Stevenson, Environmental Engineering (U)

In urban watersheds, the changes in land use associated with development alter natural hydrologic processes and directly impact water availability, frequency of floods, and erosion. Alvarado Creek is an urban channel in San Diego

that has undergone restoration efforts in our approximately 1200-meter reach. Restoration efforts include removal of invasive non-native plants and foreign debris in the 100-year floodplain. Alvarado Creek is expected to experience changes in channel geomorphology, water quantity, and quality after restoration. Hydrologic modeling of these alterations will be used to understand the potential changes and guide future restoration efforts. Field-based data and observations were collected from Fall 2015 to the present. Cross-sectional area, grain-size distribution, water quality, and stream flow data were collected before and after restoration. Continuous estimates of precipitation, stream flow, and temperature every 10-minutes are available from February 2016 to the present. The focus of this research is to develop the United States Army Corp of Engineer's Hydrologic Engineering Center's Hydraulic Modeling System (USACE HEC-HMS) to understand changes in hydrology and geomorphology in the upstream and downstream sections of the study reach. HEC-HMS will be parameterized with the preliminary field data to simulate baseline storms before and after restoration. Parameters for the model include curve number (derived from land cover and soil type), initial abstractions, lag time, and monthly base flow. The model will be calibrated and validated, and can be used to provide information about future scenarios of vegetation change in urban waterways and how changes to the watershed will affect hydrologic systems.

474 4:00 pm

Understanding the Impacts of Restoration on Channel Hydrology, Morphology, and Vegetation on Alvarado Creek using Time Lapse Photography Michael Violante, Environmental Engineering (U)

Alvarado Creek is an urban watershed near San Diego State University, which underwent restoration to remove non-native vegetation and waste. Widespread removal of non-native material has the potential to change the hydrology and geomorphology of the channel. Prior to creek restoration in February 2016, two cameras were installed and positioned to capture images upstream and downstream of a 5.5-6 ft cross-section of the study reach. These cameras acquire 10 megapixel images of Alvarado Creek at 30 minute intervals, continuously, which can be used to a create unique time lapse series of photographs. Daily variations in photographs may document changes in vegetation mass, water level, and flow regime before and after restoration. The time lapse photos can be coupled with in situ measurements and observations to estimate changes in channel form and water volume. It is anticipated that this analysis will provide qualitative monitoring of vegetation change and develop methods to estimate the waste and debris transported by the Creek. This information could provide a better understanding of how to protect and maintain this watershed in the future.

475 4:00 pm

Using Remote Sensing Data to Analyze Regional Water Budgets and Crop Productivity Kelly Flint, Environmental Engineering (U)

As climate change continues to drive redistribution of the planet's fresh water, the increasing threat of water scarcity prompts efforts to understand water use and consumption. Efficient water use is particularly pertinent for agriculture sustainability and productivity, especially in developing regions. Utilizing remote sensing data and products derived from satellite imagery from Landsat and Moderate Resolution Imaging Spectroradiometer MODIS, and relevant datasets from NASA, Google, and other institutes, this research seeks to better understand seasonal and annual water and agricultural patterns in the Iringa Region of Tanzania, Africa, Vegetation indices (EVI, NDVI) from Landsat and MODIS ranging in date from 1982 to present day, will be used to create a time series of vegetation health and productivity. MODIS Daily Normalized Difference Water Index will be used to observe daily fluctuations in the moisture content of vegetation within the area of interest. Other variables such as soil moisture, relative humidity, and rainfall, from the NASA Global Land Data Assimilation System (GLDAS) will be incorporated into this analysis. A 2013 Land use and land cover data set from the International Crops Research Institute for Semi Arid Tropics (ICRISAT) will provide a year-long time window to observe variations in health and productivity of various crops. Ultimately, this work will provide information that can be incorporated into agricultural practices to optimize water use and consumption, and promote sustainable crop management.

476 4:00 pm

Are Environmentally Friendly Buildings Always More Costly? Target Value Design Applied to Sustainable Construction

Samia Silveira, Civil Engineering (M)

Buildings are one of the largest consumers of natural resources. In the United States alone they account for 40% of the CO₂ emissions, 14% of all potable water use, and 41% of the country's primary energy consumption, surpassing the industrial (30%) and transportation (29%) sectors. Construction and demolition (C&D) debris account for 24% of municipal waste stream, and is worth mentioning that 95% of C&D debris is recyclable, since most materials are clean and unmixed. Therefore, there are lots of reasons and a great potential to push construction practices to become more environmentally friendly. However, cost and market barriers are often cited as the main obstacles for implementation of sustainable construction strategies.

To tackle that issue, this ongoing study proposes the use of Target Value in the design and construction of buildings of low environmental impact. Target Value Design (TVD) draws its origins from Toyota's Target Cost in the manufacturing industry, and essentially means to design to the budget instead of estimating the design and then readjust the cost overruns. TVD started to gain ground in California when hospitals were forced to undertake major retrofits to comply with the Seismic Safety Law. Nearly prohibitive costs pushed leaders to find ways to stay within budget and TVD was one of the most successful methods used.

The design of environmentally friendly buildings relies on the work of interdisciplinary teams. They address carbon footprint, energy and water consumption, emission of construction materials, and how all those items interact with each other. Specialty teams have to look at problems in a holistic way, rather than solving them individually for the sole purpose of their discipline. Teams need to communicate, collaborate, and interact more often, which is also true in TVD. Target Value Design is founded on cross-disciplinary teams working together from the onset of the project, sharing knowledge. The main hypothesis of this study is that the use of TVD strategies in environmentally friendly projects leads to a more realistic design and helps to break the myth that sustainable constructed buildings are necessarily more costly than traditional ones.

477 4:00 pm

Potential Opportunities for Water Conservation in the Imperial Valley, California Using METRIC EEFlux Evapotranspiration and Landsat NDVI Maegan Salinas, Geography (M)

Since the Quantification Settlement Agreement (QSA) of 2003, annual water volumes to the Imperial Valley (IV), California have decreased which negatively impacts the Salton Sea (Little Hoover Commission 2015). The sea relies on IV agricultural return flows as a source of inflow. As return flows decrease, sea salt concentrations increase and can be emitted into the air as particulate matter (Little Hoover Commission 2015). California State allocates water to the sea to mitigate deterioration but will stop after December 2017. Inflows after 2017 are projected to rapidly decline, decreasing ~400 million cubic meters.

I use remotely-sensed maps of Earth Engine Evapotranspiration Flux ("EEFlux") evapotranspiration (ET) and Landsat Normalized Difference Vegetation Index (NDVI) to implement two methods that could potentially help continue mitigation inflows into the sea after December 2017. Method 1 includes a pixelwise analysis of cumulative ET used to determine the average pixel area that consumes a cumulative 400 MCM of water per year. Method 2 implements NDVI to quantify and address areas of low productivity based on multi-year and multi-seasonal (May – October) averages.

Preliminary results include 2010 - 2011. EEFlux ET has an RSMD of 43 mm/month compared to a 24-month (Jan '10 – Dec '11) water balance and $r^2 > 0.6$ in single years and two years combined. Method 1 reveals an average area of 120 km² of the highest water consuming areas could be taken

out of production to sustain 400 2 of IV is low productive and consumes 0.77 NDVI) were used. Both methods will be further investigated with data from additional years which will include uncertainty analysis of EEFlux ET. The main objectives of the research are: 1) to implement and validate EEFlux ET maps using both point and valley-wide ET estimates, 2) to determine absolute thresholds of low, medium, and high productivity classes and 3) to employ remote sensing methods to identify opportunities for water conservation in the valley and mitigation of Salton Sea.

Session E-2

Poster: Biological & Agricultural Sciences P6 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

478 4:00 pm

Antibiotic Effect on Immune System Nelissa Figueroa, Microbiology Emphasis in Clinical Lab Science (U)

Antibiotic treatment of neonates contributes to adults contracting several diseases due to life long progressive alterations in the immune system. Because of this early onset of antibiotic treatment, the disrupted immune response allows more risk of inflammatory disease in the adult. However, there are no long-term alterations when adult animals are treated. The study examines these effects in the context of anti-inflammatory cholinergic lymphocytes. Cholinergic lymphocytes are responsible for creating anti-inflammatory response. The study assesses the impact antibiotic treatment of neonates has on cholinergic lymphocytes and how it affects anti-inflammatory immune response in adults. The proposal is that there is greater likelihood for adult animals to develop inflammatory disease when they have also been treated with antibiotics as neonates because that affects cholinergic lymphocytes. The antibiotic of interest was neomycin.

Neonatal mice are treated with the antibiotic neomycin from the start of birth to twenty days old. As adults, they are insufflated with flu. Mice that are not on neomycin treatment serve as controls. Illness and recovery was measured with kinetics and the degree of weight loss and regain following infection. Flo cytometry is used to measure and assess the status of immune response throughout the infection with influenza. Cell counts were analyzed from the peritoneal cavity, pleura, and lungs, using the Flo Cytometer before and after staining. In contrast to similar, published data on this study, there was no obvious difference in illness or recovery when the mice were treated and infected with flu.

479 4:00 pm

Inhibition of the Ampicillin Resistance gene by Antisense RNA Netaliya Zora, Biology (U)

Due to overuse of antibiotics worldwide to treat patients and for agricultural use, bacteria are becoming more resistant to antibiotics. Doctors are running out of antibiotics to prescribe to patients with bacterial infection. Pharmaceutical companies are not motivated to produce or discover new sources of antibiotics because it is not profitable. In this study, we provide a practical approach to inhibiting antibiotic resistant bacteria. We are inhibiting antibiotic resistant bacteria by antisense RNA technology. We designed antisense RNA against the Ampicillin Resistant gene and cloned it under the control of the T7 promoter in the pET 46 plasmid which harbors the Amp resistance gene. Upon addition of IPTG, the antisense RNA binds to the Amp resistance gene and inhibits expression of β -lactamase. Inhibition of β -lactamase is assayed by plating on Amp¹⁰⁰ LB plates. A scramble antisense RNA control was used to determine the efficiency of inhibition by the antisense RNA specific to the Amp resistance gene. Compared to the scramble antisense RNA control, we observed that the antisense RNA specific to the Amp resistance gene inhibited β -lactamase expression by at least a two log difference. This suggests that the Amp antisense RNA is specific to the Amp resistance gene since the scramble antisense RNA was not able to inhibit β-lactamase expression. This study shows that the antisense RNA technology is a good alternative to inhibiting bacteria that are resistant to antibiotics.

480 4:00 pm

Developing a Reliable Read-Out of TLR7 Activation Charles Vallez, Cell and Molecular Biology (U)

Rationale: Cancer immunotherapy represents a promising frontier for targeted cancer treatments that instruct the immune system to destroy cancer cells while leaving healthy tissue intact. Combining mechanical destruction of tumors using High Intensity Focused Ultrasound (HIFU) with agonist-mediated stimulation of the Toll-Like Receptor (TLR) innate immune pathway is expected to improve cancer treatment outcomes. Targeted activation of the TLR7 pathway triggers a rapid inflammatory response leading to maturation of antigen-presenting cells (APCs), thereby increasing specific immune activity. Conjugation of TLR7 agonists to a silica nano-shell delivery platform is hypothesized to enhance the TLR7 response. Validating novel and specific TLR7 agonists is a critical step in developing this component of the proposed combined therapy.

Objective: The goal of this project is to establish a robust, reliable, accessible assay to assess TLR7 pathway activation in response to experimental TLR7 agonists.

Methods: RAW 264.7 cells, a murine macrophage-like cell line, were stimulated with the experimental TLR7 agonist 1V209. Cells were collected for RNA and protein extraction, and

expression of established TLR7 target cytokines TNFa and IL-6 measured at various time points to establish peak mRNA and protein levels of each target. LPS was used as a positive control for immune cell stimulation while Resiquimod was used as a positive control for TLR7 pathway activation. RNA levels were measured by quantitative real time PCR and protein levels were assayed by immunoblot.

Results: Peak expression of TNFa mRNA was consistently observed at 1 hour in response to LPS, Resiquimod and 1V209 treatments, whereas IL-6 mRNA reached maximum levels at 6 hours following LPS and 1V209 treatment, and after 18 hours following treatment with 1uM Resiquimod. Cellular TNFa protein levels were clearly induced by 24 hours as measured by immunoblot analysis.

Conclusions: 1V209 acts as an effective TLR7 agonist in RAW cells and induces expression of TNFa and IL-6 mRNA in a time dependent manner. TNFa expression serves as a more reliable readout than IL-6 and other cytokines for TLR7 pathway activation and will be used in future experiments to compare the effectiveness of nano-shell conjugated versus soluble 1V209 in stimulating the TLR7 pathway.

481 4:00 pm

SoxB1-2 expression is essential for the specification and maintenance of sensory neurons in planarians Karla Gonzalez, Biology (U)

SOXB1 proteins are transcription factors that are required for neurogenesis in mammals. Loss of the SoxB1 gene Sox1 results in epilepsies in mice and humans, however, its downstream targets in the adult brain are largely unknown. The planarian Schmidtea mediterranea is an excellent model organism for studying the role SoxB1 genes play during adult brain neurogenesis because of their ability to completely regenerate neurons from adult pluripotent stem cells. To explore the roles of SoxB1 genes in planarians, we screened SoxB1 homologs for expression and function in planarians and found one gene, SoxB1-2, was expressed in sensory neurons. Remarkably, when we inhibited expression of SoxB1-2 (via RNAi), animals displayed seizure-like behaviors. Thus, we hypothesized that SoxB1-2 expression is necessary for function and maintenance of a subset of sensory neurons in planarians and loss of function leads to sensory defects and seizure phenotypes. To test our hypothesis, we isolated RNA from control and SoxB1-2(RNAi) planarians and performed mRNA sequencing at days 6, 14 and 24 following the knockdown. We found day 14 (when seizure phenotypes start to appear) to be most enriched for sensory neuron genes. We performed an RNAi screen against 98 genes that had gene ontology terms associated with neural function. Knockdown of a subset of these genes resulted in phenotypes consistent with seizure-like behaviors and loss of sensory neuron function. Additionally, we performed whole mount v hybridization on these genes to correlate gene expression with function. As a result, we identified a cell population necessary for water flow sensation in planarians. We performed immunolabeling experiments on RNAi animals to see if cilia loss could explain performance

in behavioral assays and found a depletion of cilia at areas necessary for normal gliding locomotion and sensory function. We conclude that SoxB1-2 activates transcription of genes necessary for sensory neural function and locomotion. In future studies, we will further characterize the SoxB1-2-expressing sensory neurons. Altogether, these studies should establish planarians as a model for studying the molecular basis of seizure disorders in humans.

482 4:00 pm Calcium fluxes modeled in cultured neonatal ventricular cardiomyocytes Noor Atto, Biochemistry (U)

Experiment design: Data from cultured Sprague Dawley neonatal ventricular rat myocytes (NVRMs) can be used to create a cell model of calcium fluxes in the heart cell. Excitation contraction coupling (ECC) is the mechanism by which extracellular calcium enters the cell membrane via L-type channels, triggers large local releases of intracellular calcium from the sarcoplasmic reticulum (SR) via ryanodine receptors (RyR), and ends when the cytosolic calcium is either removed to the extracellular space via the sodium-calcium exchanger (NCX) or resequestered into the SR via the sarcoendoplasmic calcium transport ATPase (SERCA) pump. In this study, the goal has been to develop an understanding of the NVRM ECC mechanism by understanding interactions among the three calcium transport systems. We individually downregulate major key genes involved in calcium handling: SERCA, RvR, and NCX: and we use computational models to recreate experimental results. Ventricular arrhythmias are a major cause of cardiac death, especially sudden cardiac death in myocardial infarction and heart failure when cells are treated with the antidiabetic drug rosiglitazone.

Methods: NVRMs are harvested from one day old rats. Cells are cultured in 10% FBS and treated with siRNAs to down-regulate the calcium handling genes. Calcium transients are then recorded for two days after the treatments have been administered. The computational model uses ODEs and introduces a new geometry of the cell. Silencing each of these key channels one at a time can mimic specific cardiovascular diseases and arrhythmias and can selectively cause a loss in the cell's ability to fire. In this study, we show that these changes in NVRMs can conceivably contribute to sudden heart death by causing an instability in the cell as it continued to fire. We studied cells with and without rosiglitazone treatment at 2 hours, 24 hours and 48 hours after treatment with the drug.

We used our experimental results to show input for realistic simulated calcium transients by augmenting previously described adult and neonatal cardiomyocyte models. The model recreates steady state transients while also exhibiting transients that have silenced genes. This model creates a platform for studying cultured cardiomyocytes at early post-natal developmental stages.

483 4:00 pm

Targeting of CD98 by the E3 Ubiquitin Ligase MARCH1

Susana Najera, Cell and Molecular Biology and Spanish (U)

CD98 supports adhesive signaling and amino acid-transport enabling rapid cell proliferation. Genetic ablation studies revealed that CD98 is essential for proliferation of multiple cell types including cancer cells. CD98 is a type I transmembrane protein and it is at the cell surface where CD98 interacts with integrins and its light chains to amplify adhesive signaling and amino acid transport, respectively. Surface expression of CD98 is regulated post-translationally by MARCH1 and MARCH8, members of a novel class of E3 ubiquitin-ligases. MARCH1 limits CD98 dependent proliferation of lymphocytes, and potentially cancer cells, by selectively targeting CD98 for ubiquitylation and subsequent lysosomal degradation. However, the mechanism by which MARCH1 targets and interacts with CD98 is still poorly understood. Our goal is to decipher how MARCH1 achieves specificity for its substrates using CD98 as a model substrate. Since MARCH1 isoforms have unique N-termini, we initially hypothesized that the N-terminus of MARCH1 mediated the interaction with CD98. Ectopic expression of either isoform of MARCH1 in HeLa cells resulted in down regulation of CD98 from the cell surface, while ectopic expression of a catalytically inactive mutant of MARCH1 had no effect. Thus, the N-terminus alone does not determine MARCH1 specificity for CD98. We next expanded our hypothesis to include other domains of MARCH1 that could be responsible for imparting specificity for CD98. To test this hypothesis, we generated chimeras of MARCH1 and MARCH3 (MARCH3 has no specificity for CD98) to determine which regions of MARCH1 impart specificity for CD98. Our preliminary results confirmed that the N-terminus of MARCH1 alone, is not sufficient for targeting of CD98. Likewise, the RING domain, the transmembrane domains and C-terminus of MARCH1 on their own are not sufficient to impart CD98 specificity to MARCH3. Together these observations suggest that the domains of MARCH1 likely work in combination to selectively interact with CD98 and target it for degradation.

Session E-3

Poster: Physical & Mathematical P5 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

484 4:00 pm

Analyzing the Electrochemical Trend of Benzoquinone Being Titrated in Unbuffered Aqueous Solution

Ilan Sobel, Chemistry (U)

Introduction: The redox chemistry of quiones is important to understand because they play a role in biological electron transport, and quiones are used in various manufacturing processes such as dyes for clothing. The redox behavior of benzoquinone in buffered, aqueous solutions, as well as nonaqueous solutions, is well understood. However, further research needs to be conducted to assess the redox behavior of benzoquinone in unbuffered, aqueous solutions as it is being titrated by acids with different pKa's.

Methods: Cyclic voltammetry was used to analyze the potential of benzoquinone as it was being titrated by different acids. The experiments were conducted in an aqueous, unbuffered 0.5 M KCl solution. The acids tested so far are trichloroacetic acid, chloroacetic acid, formic acid, and acetic acid.

Results/Discussion: Using a potentiostat to measure benzoquinone when titrated, the difference in peak E1/2 versus the pKa's of the acids corresponded to a third degree polynomial. The relationship was as pKa increased, the difference in E1/2 decreased. Upon addition of the acid, a new redox process appears at more positive potentials. This probably corresponds to the reaction BQ + 2HA + 2e = BQH2. According to this, there should have been a linear relationship for the pKa of the acid. This assumes that there is no significant prior dissociation of the acid, which is likely not true for some of the acids. Since this is an interim report, the results are not completed yet, which is important to take into consideration. Weaker acids have been selected for future testing.

The original peak disappearing and the second peak appearing were caused by reduction and oxidation of the quinone species, the quinone attached to one hydrogen (QH) and the quinone attached to two hydrogens (QH2). Some limitations of this study was the possibility of a bad scale or micro syringe, which caused certain trials and experiments to be discarded because they were outliers.

485 4:00 pm

A Method to Assemble Larger Supramolecular Structures Through Radical Pi Stacking Interactions Using Viologens

Joquel Vasquez, Biochemistry (U)

This project is an investigation on self-assembled nanostructures. Supramolecular molecules are unique in that they are formed from typically weak, non-covalent interactions such as H-bonding, Van Der Waals forces, electrostatic interactions, and ion pairing interactions. This study specifically focuses on the formation of supramolecular structures formed through radical pi dimers- a new type of interaction. It is known that organic molecules with extended pi systems that form stable radicals will dimerize in aqueous solution. One system known to do this is Viologens. They form a pi dimer through a weak, non-conventional covalent bond, resulting in spin pairing. Our aim is to confirm that supramolecular assemblies can be facilitated by linking viologens. The current study is of xylene-linked viologens and uses methyl viologen as a test system. Methyl viologen (MV) radical cations are well known to dimerize. We use UV-Vis spectroscopy in order to measure the K_{Dimerization} since the viologen dimer and monomer are known to have different absorption spectra. The viologen radicals are highly oxygen sensitive, which greatly complicates the

experimental setup since oxygen must be excluded. In previous experiments, we used bulk electrolysis in addition to a UV-vis flow cell in order to obtain the spectra. Currently chemical reduction is performed with the addition of sodium dithionate to our solution. We compare the data at low concentrations and high concentrations noting whether the methyl viologen radical exists primarily as a monomer form or dimerized form. It is possible to see clear differences between the spectra of methyl viologen and the xylyl-linked viologen, indicating that at concentrations where methyl viologen radical exists primarily as a monomer, the linked viologen radicals are completely dimerized. Since the xylyl bridge prevents intramolecular dimerization, intermolecular supramolecular aggregates must be forming. Future work will include improving our methodology to achieve complete reduction and further concentration studies of both methyl viologen and the xylyl-linked viologen to measure the K_{Dimerization}.

486 4:00 pm

Novel Detection of Biomarkers Highly sensitive detection methods are required to diagnose diseases and monitor treatment progress using biomarkers. Ourof Pancreatic Cancer Using Nonlinear Multi-Photon Laser Detectors Interfaced to Separation Techniques

Jie Liang, Chemistry (M)

Highly sensitive detection methods are required to diagnose diseases and monitor treatment progress using biomarkers. Our study focuses on the biomarker carbohydrate antigen 19-9 (CA19-9). Current detection methods have certain shortcomings, such as the need for complicated and time-consuming labeling steps for sensitivity, and the use of the antibody for specificity. Our patented nonlinear laser wave-mixing methods offer advantages including label-free native detection, absorption-based analysis, excellent sensitivity, small sample requirements, short optical path length, and high spatial resolution. Since the wave-mixing probe volume is small (nanoliter to picoliter), it is inherently suitable for microfluidics or capillary-based electrophoresis systems (e.g., 20 µm microfluidic channels or 75 µm i.d. fused silica capillary). One can run a standard protein ladder with a label to estimate capillary electrophoresis retention time for CA 19-9. Since wave mixing is an absorption-based method, we could use both fluorophore and chromophore labels. Fluorescein isothiocyanate (FITC), a primary amine reactive dye, is used for CA 19-9 since there are twenty-two lysine groups in CA 19-9, and a 473 nm solid-state laser serves as the excitation source. 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. We will demonstrate wave-mixing advantages including excellent detection sensitivity levels for early diagnosis of pancreatic cancer.

487 4:00 pm

Sensitive Analysis of Multiple Sclerosis Biomarker Using Nonlinear Multi-Photon Laser Wave-Mixing Spectroscopy Filippo Venturini, Chemistry (M)

Nonlinear laser wave mixing is demonstrated as a highly sensitive absorption-based detection method for multiple sclerosis biomarkers. Sensitive chemical-based detection methods are needed in order to detect multiple sclerosis in early stages before lesions grow to the size that can be detected by MRI. Laser wave mixing offers inherent advantages including excellent sensitivity (zeptomole), small sample requirements (nL-pL), short optical path length (micrometer), and high spectral and spatial resolution levels. The multiple sclerosis symptoms are caused mainly by the destruction of myelin in the central nervous system, and due to its similarity with other neurological disorders, it is challenging to confirm multiple sclerosis without a sensitive chemical-based detection method. There is still a wide range of proposed biomarkers for multiple sclerosis since the pathology is not yet completely understood. We focus on the myelin basic protein (MBP), a widely accepted multiple sclerosis biomarker. It can be detected by laser wave mixing using either fluorophore or chromophore labels. In a typical wave-mixing setup, the signal is generated when the two input beams intersect in the sample containing label-free or labeled biomarkers, using UV lasers or visible lasers, respectively. The signal is a coherent laser-like beam and it can be collected with virtually 100% efficiency and excellent signal-to-noise ratio. The signal has a guadratic dependence on analyte concentration, and hence, it is inherently suitable as a chemical sensor. We obtained excellent preliminary results for myelin basic protein that are comparable or better than those reported for fluorescence-based detection methods.

488 4:00 pm

Ultrasensitive Detection of Cancer Biomarker CEA Using Nonlinear Degenerate Four-Wave Mixing Spectroscopy James Suprapto, Chemistry (M)

Nonlinear laser wave-mixing spectroscopy interfaced to capillary electrophoresis is demonstrated as an ultrasensitive, label-free, antibody-free detection method for cancer biomarker carcinoembryonic antigen (CEA). Wave mixing offers inherent advantages over conventional methods including zeptomole-level detection and high spatial resolution suitable for single-cell analysis. A single laser is used to generate two input beams that are then focused and mixed inside the sample cell. The input beams create interference gratings, which in turn diffract incoming photons to produce two coherent laser-like signal beams. The stronger signal beam is collected by a photodetector with high optical collection efficiency and excellent S/N. Separation of proteins in a serum sample is obtained by capillary electrophoresis. Since CEA absorbs in the UV wavelength range, a 20 mW 266 nm UV solid-state laser is used to excite the analyte in its native form without the use of labels. The wave-mixing signal has a cubic dependence on laser power and a quadratic dependence on analyte concentration, and hence, small changes in the analyte can be monitored efficiently. Our wave-mixing detection sensitivity levels are comparable or better than those of ELISA or fluorescence-based techniques and wave-mixing detection is applicable to both fluorescing (labeled) and non-fluorescing (label-free) samples. Our nonlinear multi-photon detectors can be easily configured as battery-powered portable devices that are suitable for field use. Potential applications include detection of various biomarkers, cancer cells, viruses, single cells and reliable and early detection of diseases.

Session E-4

Poster: Education P1 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

489 4:00 pm

The Impact of Native-Language Literacy Interventions on Bilingual Reading Fluency Jenna Palacios, School Psychology (M)

Second language learners (SLLs), are an ever-increasing population in today's schools, and from the time they enter kindergarten until they reach high school, they fall far behind on nearly all academic measures (Gándara & Hopkins, 2010). They face significantly more educational challenges than other student groups and have been central to controversial language policies and reforms (García, 2009). Despite legislation and restrictive language policies that promote the English-only theory, the extant literature suggests that strong instruction in the student's native language can strengthen proficiency in second language acquisition and build new academic skills (Cummins, 1979, 1981, 1984).

In the current investigation, two literacy interventions were implemented in Spanish and compared; a) Letter/Sound Boxes (LSB) and b) Paired Reading with vocabulary instruction (PRVI). The participant is a 3rd grade Latino, Spanish-speaking student that was repeatedly referred for intervention for low performance in Reading, Writing, and oral language. English reading skills were also tracked to determine linguistic transference. It was hypothesized that native language interventions would increase oral reading abilities in both languages. Single-case design methodology; more specifically an alternating treatment design compared effectiveness of both interventions (Riley-Tillman & Burns, 2010).

The two independent variables, LSB and PRVI were implemented over eight weeks, with each treatment having eight sessions. Outcome measures included oral reading fluency measured using probes from *Indicadores Dinámicos del Éxito en la Lectura* (IDEL) (Fluidez en Lectura Oral, FLO) and Dynamic Indicators for Basic Early Literacy Skills (DIBELS). Additionally, nonsense word fluency was also tracked through the use of probes from IDEL (Fluidez en las Palabras sin Sentido, FPS) and DIBELS Next (Nonsense Word Fluency, NWF).

Data collected were analyzed and interpreted through visual analysis and inspection to examine changes within and between phases. To supplement visual inspection, effect sizes were also calculated. Results showed that Letter/Sound boxes had a greater impact on Spanish oral reading fluency and both interventions yielded improvements in the student's English reading fluency and Spanish and English phonological awareness. The current study strengthened previous literature supporting two commonly used literacy interventions but with implementation in the student's native language.

490 4:00 pm

Simulating Poverty to Develop Awareness and Empathy in Educators

Brian Thammavong, Social Work (M)

Poverty is linked with a myriad of public health concerns such as chronic disease and increased social vulnerability in terms of economic performance and environmental safety (Center for Disease Control and Prevention, 2016); within this population youth under 18 make up the largest percentage of those in poverty (U.S. Census Bureau, 2016). Poverty is a major contributor in the achievement gap amongst poor and minority students, legislation such as No Child Left Behind has sought to remedy this from an administrative standpoint using standardized testing and punitive sanctions as tools for reducing the gap. This study evaluates the effectiveness of a poverty simulation, the Community Action Poverty Simulation (CAPS) program, in raising awareness and empathy in teachers regarding the conditions of poverty. This is a necessary endeavor as teacher credentialing curriculums do not formally include training on making education accessible to the poor. This study uses data that was gathered from three separate administrations of the CAPS program with elementary school teachers in San Diego in 2016. During each administration, teachers were given a pre and post survey in order to measure their feelings and awareness about those in poverty. Additional survey data was gathered from the student volunteers that staffed the simulation. These volunteers were undergraduate and graduate students from a collegiate school of social work, whose academic curriculum engages with the effects of poverty. Initial findings showed an increase in understanding of the culture of poverty on behalf of the teachers, many of whom cited the difficult nature of making ends meet within the simulation as an eye-opening and empathy building experience. The student volunteers expressed an increase in empathy, but not to the same degree as the teachers. Participants also expressed a desire for "next steps" as the simulation gave them a sense of empathy, but left them without a clear sense of direction. While the CAPS program was effective in increasing awareness and empathy, it would be even more useful as a training tool for teachers if paired with clear strategies for increasing educational access and equality for students and families in poverty.

491 4:00 pm

Addressing Student Social-Emotional Needs in High-Performing Schools

Nancy Nguyen, Sociology (U)

For decades, educators have dedicated their professional lives to answering the question - "How can we effectively and efficiently enhance students' academic performance?" Across the nation, education scholars and practitioners continuously develop and implement intricate plans for improving student success. Existing research points to the social-emotional needs of students as a focus for enhancing academic performance. This study investigated the approaches employed by personnel in high-performing, urban, K-12 schools that serve low-income communities, as they address the emotional and social needs of their students. Did school personnel in high-performing schools intentionally address the social-emotional needs of their students? If so, how did they do so? Is there evidence that suggests that attention to students' social-emotional needs might have positively influenced student achievement?

Focusing upon schools that have received the National Center for Urban School Transformation's National Excellence in Urban Education Award, qualitative data were collected from a purposive sample of informants (teachers and administrators) across four urban K-12 schools that serve low-income communities. Each interview was semi-structured to address pre-established questions, addressing the informants' experiences with instruction, relationships with other staff and students, opinions on school programs/policy, and personal anecdotes with students. Interview transcripts were coded, thematic summaries were established, and data matrices were mapped.

Informants identified students' ability to openly express feelings as a dominating "emotional need." As well, informants identified issues associated with low family incomes and family language backgrounds as dominating "social needs". Rather than discussing specific managerial and/or programmatic efforts employed by the school, the informants consistently discussed the importance of fostering a welcoming school environment as their primary approach in supporting students. Central themes in fostering this safe school environment are broken into three categories: positive staff relationships, a safe student-teacher dynamic, and efforts to engage parents and community members. The common narrative for improving students' educational outcomes entails implementing institutional programs and services. However, our findings are congruent with other findings that suggest K-12 schools need to work towards fostering an inclusive and safe school environment in order to ensure the success of students of color and students from low-income families.

492 4:00 pm

Investigating the Effect of Supplemental Instruction on Underrepresented Minority Students Xiela Ross Edusada, Public Health (U)

Supplemental Instruction (SI) is a pilot program at San Diego State University adopted from the proven University of Kansas City-Missouri model which is aimed to reduce failure rates in high-challenge and bottleneck courses. SI was implemented in the Fall of 2015 in Dr. Laumakis' Psychology 101 course. The program utilizes previously successful students to facilitate study sessions to encourage active learning strategies for currently enrolled students. Our research goal is to study the relationship between SI attendance and course success for underrepresented minority (URM) and non-underrepresented minority (non-URM) students in Psychology 101 for the Spring of 2016. This research is significant in Psychology 101 as it consistently enrolls approximately 700 students each semester, many of whom are fulfilling pre-major and general education requirements.

To track student performance as a result of SI attendance, course grades of students who attended SI sessions are compared to their counterparts who did not attend SI. Taking this analysis a step further, student grades will be analyzed to measure any statistical differences between URM and non-URM students who did not attend SI, attended between 1-3 times, and attended 4 or more times. The student sample will be subgrouped in order to compare the relationship between the amount of exposure to SI and the average grade received.

Initial findings show that URM students are slightly overrepresented in repeatable grades. While URM students represent 32% of the class population, they represent 41% of repeatable grades. On the other hand, non-URM students represent 68% of the class population and 59% of repeatable grades. Further analysis was done using a Chi-squared test to measure this discrepancy, generating a p-value of 0.020 which demonstrates a statistically significant difference between the populations. This poster will provide analysis to demonstrate whether or not SI participation has an effect on URM students.

Session E-5

Poster: Behavioral & Social Sciences P13 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

493 4:00 pm

Differential Effects of Age on Recall and Recognition Discriminability in Men and Women

Meghan Ursa, Psychology (U)

Recall and recognition memory abilities are known to decline with normal aging. However, much of the evidence stems from studies that relied on simple measures of total target recall or recognition. The California Verbal Learning Test–Second Edition (CVLT-II) includes a new measures of discriminability that generate more thorough assessments of recall and recognition by taking intrusion and false positive errors, respectively, into account. Research has also shown that women outperform men on verbal episodic memory tests. There is some evidence to suggest the negative association between age and verbal memory performance may differ by gender. Nonetheless, the effects of age and gender on discriminability measures have not thoroughly examined. Cognitively healthy adults (N=223) 18-91 years in age were administered the CVLT-II. Multiple regression analyses were conducted to examine effects of age and gender on recall and recognition discriminability measures. To explore whether the association between age and verbal memory performance differs by gender, multiple regression analyses were conducted to examine both linear and quadratic effects of age on discriminability measures in men and women. Corrections for multiple comparisons were applied. Discriminability scores decreased with increasing age, and women outperformed men on all discriminability measures (ps <.01). Additionally, analyses revealed a significant quadratic effect of age (over and above a linear effect) on all subtypes of recall discriminability in women: total recall, F(1, 116) = 15.57, p<.001; immediate recall, F(1, 116) = 11.91, p=.001; delayed recall, F(1, 116) = 16.80, p<.001; free recall, F(1, 116) = 16.96, p<.001; cued recall, F(1, 116) = 11.79, p=.001. The quadratic effect in women reflected an inverted U-shaped relationship between age and recall scores, but a quadratic effect of age on recognition discriminability scores was not observed. Moreover, only negative linear effects of age on recall and recognition discriminability scores were observed in men. The present findings support and expand upon existing literature. Additionally, they describe a novel age-by-gender interaction intrinsic to certain subtypes of recall discriminability. The findings suggest that methods traditionally used to assess recognition memory function can be used to elucidate age-and gender-related changes in recall ability across the adult lifespan.

494 4:00 pm

Spatial Recognition Memory Across the Adult Lifespan: Evidence for Age-Related Deficits in Spatial Pattern Separation in Middle and Old Age Shannon Yandall DeJesus, Psychology (U)

Age-related changes in pattern separation may contribute to spatial memory impairment in older adults. Two recent studies indicate that pattern separation may be less efficient in middle-aged adults on tests involving visual objects or temporal sequences; however, this has not been investigated using a spatial task. We used signal detection theory (SDT) to assess spatial recognition memory across the adult lifespan using a new behavioral test hypothesized to tax pattern separation. Correlations with standardized neuropsychological tests also were examined. Healthy young (YA; n=39), middle-aged (MA; n=30), and older (OA; n=30) adults completed our spatial recognition memory test. On each trial, participants remembered the location of a circle on a computer screen. Then, a circle appeared either in the same location or a different location that was separated from the original location by a small or larger separation. Participants indicated whether the

circle was in the "same" or a "different" location. Smaller spatial separations on "different" trials were hypothesized to result in greater interference than larger separations, placing greater demands on pattern separation. On large separation trials, we found that YA outperformed both the MA and OA, while the MA outperformed the OA (ps < .05). On small separation trials, the YA significantly outperformed both MA and OA (p < .05); however, there was no significant difference between MA and OA. All groups performed significantly better on large separation trials compared to small separation trials (p < .05). Performance correlated significantly with standardized measures of memory, visuospatial perception, and spatial attention (ps < .05), but not word reading or auditory attention. Using a new test and SDT, we found that age-related changes in spatial pattern separation may begin in middle age. We also found preliminary evidence for construct validity of our test in healthy adults.

495 4:00 pm

The Role of Gender in Odor Tasks Aimed at Predicting Alzheimer's Disease Jeremea Songco, Psychology (U)

Alzheimer's Disease (AD) affects cognition, behavior, and can promote disorientation in affected individuals. During the earliest stages of this neurodegenerative disease, one of the first brain areas impacted is the entorhinal cortex (EC). Connected to the hippocampus, the EC plays a central role in the networks associated with memory and navigation. Similarly involved in the EC-system is olfactory functioning, which has been found by many studies to be correlated with cognitive decline in healthy- and AD-aging individuals. Previous research has also indicated gender differences within this relationship, with women outperforming men in odor identification and recognition. However, almost two-thirds of AD individuals are women. In addition, at age 65, women have a 1 in 6 chance of developing AD whereas men have a 1 in 11 chance. The current study aims to further investigate gender differences in olfactory functioning, more specifically analyzing how odor recognition differs between the two groups in the elderly, as such tasks are part of a set of measurements that aid in identifying individuals at risk for dementia or AD. In addition, this study also aims to test the validity of our current measurement against measurements utilized in similar research. Healthy-aging participants were administered the California Odor Learning Test (COLT) to evaluate odor identification and recognition. Odors were presented one at a time, and for five trials, participants were asked to recall as many of the odors after presentation as they could remember. After a 20-minute delay, the participants were presented odors one at a time and asked to identify whether the presented odor was a part of the original list or not. An independent samples t-test revealed no significant differences between women and men on long-delayed odor recognition. Due to limitations regarding sample size, these preliminary findings do not support previous findings that women outperform men on episodic long-term memory and odor identification and recognition memory tasks. Future research may investigate this and similar COLT research utilizing a larger sample.

496 4:00 pm

Potential Differential Variability of Inflammatory Blood Biomarkers as a Function of Age Sarah Gough, Psychology (U)

Given the rapidly growing aging population, an increased interest has developed in studying the aging process and diseases associated with it. One such process associated with aging is inflammation, as there is evidence that as one ages there is an increase in chronic inflammation detected by the presence of certain proinflammatory biomarkers (which can be defined as biological agents whose presence may indicate underlying systemic diseases). Several biomarkers including Interleukin-6 (IL-6), and Tumor Necrosis Factor Alpha (TNF-a) have been implicated as possible predictive variables of inflammatory dysregulation associated with aging. In other areas, like cognitive function, there has been a recent interest in variability of performance within an individual; a meta-analysis found that intraindividual variability (IIV) in reaction time tests was greater in older compared to younger adults. I proposed to study this phenomenon in the area of inflammatory processes by examining the relationship between age and biomarker fluctuation. Based on previous research, I hypothesize that 1) mean levels of certain inflammatory biomarkers will be positively correlated with age, and 2) older age will be associated with greater biomarker IIV scores, even after accounting for mean levels. Samples from healthy comparison participants (ages 35 to 60 at baseline) from the longitudinal "Dynamic Inflammatory and Mood Predictors of Cognitive Aging" study were obtained. A licensed phlebotomist drew 15 mLs of blood from participants at three time points over the course of two weeks. A sandwich immunoassay with MSD MULTI-SPOT® Assay kits was used to test participant samples. Distribution of IIV scores for each biomarker was normal therefore we proceeded with performing correlational analyses between IIV and age, accounting for participants mean scores. Unfortunately, there were no significant correlations (p < .05) between age and IIV scores for any of the biomarkers examined. Several factors (like BMI, hypertension, stroke risk and gender) are being examined to determine if they significantly influenced the relationship between age and IIV score. Initial analyses including creation of scatter plots reveals differing patterns of distribution of IIV versus age scores for men compared to women, indicating that gender may play a mediating role in biomarker variation.

497 4:00 pm

Older Adults Prioritize Cognitive Tasks Above Balance Control when Engaged in a Dual Task Sergio Olvera, Psychology (U)

According to the Centers for Disease Control and Prevention, 1 in 3 older adults will suffer a fatal or non-fatal fall-related injury each year. Prior literature suggests that increased postural sway is linked with an increased risk of falling in older adults. A dual-task was used in a laboratory setting to assess the ability of older adults to maintain postural stability while engaged in a

cognitive task. The purpose of this study was to investigate the effects of concurrent cognitive loading on postural sway. The study assessed 20 younger adults (18-25) and 16 older adults (60+) on the task. The Balance Tracking System (BTrackS, San Diego, CA) force plate was used to measure postural sway. The Paced Auditory Serial Addition Test (PASAT) is a measure that assesses auditory information, processing speed, and flexibility, as well as calculation ability. The modified PASAT was presented through speakers and consisted of 15 numbers each presented 1.4 s apart across a 20-s trial. At the end of the trial, the participant provided the sum of the 15 numbers. The two conditions, each consisting of three trials that measure center of pressure displacement in centimeters, were eyes open plus PASAT and eyes closed plus PASAT. The participants' average difference scores from the target number on the PASAT were calculated. Multiple t-tests assessing the difference between the average PASAT difference scores of younger and older adults and average postural sway were calculated. Older adults produced significantly more average postural sway compared to younger adults in the eyes open plus PASAT and eyes closed plus PASAT conditions, p's < .05. However, there were no differences between younger and older adults on the average PASAT difference scores, p's > .05. The results suggest that older adults may prioritize cognitive tasks above balance control when engaged in a dual task. The findings may have potential implications for identifying older adults at greater risk of falling, particularly when cognitively distracted.

498 4:00 pm

Nighttime Blood Pressure Dipping is Negatively Associated with Age in Healthy Adults Stephanie Coffin, Kinesiology, Pre-Physical Therapy (U)

Introduction: Ambulatory blood pressure (BP) monitoring is an effective tool to identify the presence of night dipping (ND) in a clinical setting. Normal ND is a $\geq 10\%$ to $\leq 20\%$ difference between daytime mean BP and nighttime mean BP for both systolic and diastolic values (extreme ND = >20% difference). Reports on the associations of ND with demographic characteristics (e.g., age) are minimal. Purpose: 1) To identify the presence and magnitude of ND in young, healthy adults and 2) to evaluate the associations between ND, age, body mass index (BMI), and physical activity (PA). Methods: Twelve subjects, 8 females and 4 males, (mean \pm SD age, 35 \pm 1.4 years; BMI, 25.9 ± 1.4 kg/m²) participated in this study. Resting BP (SBP: 108.8 ± 9.3 mmHg; DBP: 70.0 ± 9.2 mmHg) was measured. Subjects were asked to complete a demographic and PA questionnaire and wear a 24-hr BP monitoring system (Oscar 2, SunTech Medical Inc., Morrisville, NC). Another resting BP (SBP: 105.5 ± 9.7 ; DBP: 69.2 ± 8.8) was obtained after monitoring. ND was calculated as a ratio (mean nighttime BP/ mean daytime BP). SBP ratio is considered the most physiologically insightful value and was used in our analyses. Pearson product moment correlations were conducted in SPSS v.23 (IBM Corporation, Armonk, NY). Results: Normal to extreme ND was observed in 75% of participants. The remaining 25% were classified as non-dippers. There was a

negative association between SBP ratio and age (r = -.687, p < .05). No associations between SBP ratio and BMI and PA were observed. However, there was a negative association between BMI and PA (r = -.766, p < .01). Conclusion: In this study, normal to extreme ND appeared to be a common occurrence. Although, the longitudinal impact of extreme dipping is unknown, some studies have linked it with an increased risk of cerebro-/cardiovascular events. Our findings appear to be consistent with this since age is a risk factor for cardiovascular disease. Future research is needed to determine if, and when, extreme dipping is unfavorable and conversely, if normal dipping is protective.

Session E-6

Poster: Biological & Agricultural Sciences P7 Friday, March 3, 2017, 4:00 pm Location: Montezuma Hall

499 4:00 pm

"Hole" Genome Sequencing: Illumina Blind Spots in *Mycobacterium tuberculosis* Genome Tal Shmaya, bioinformatics (M)

M. tuberculosis (Mtb) is the bacteria that causes tuberculosis. Its genome is known to have a GC-rich content and many repetitive regions. Due to its low cost, Illumina short read sequencing technology has become the predominant technology used for sequencing the Mtb genome. However, due to the GC bias in amplification and ambiguity of mapping short reads to repetitive regions, consensus calling in certain regions of Mtb genome suffers from uncertain base calling (due to low coverage), ambiguous read mapping (due to reads mapping to more than one location in repeat regions). or both. In this study we empirically determined these regions and provide the community with a comprehensive list of genes containing loci that cannot be reliably assembled with Illumina short-reads. Our results show that such holes are not limited to PE-PGRS genes and that they are scattered across the genome.

Publically available Illumina short reads were downloaded for 254 Mtb genomes. A pipeline comprised of trimming artifacts, aligning and generating a consensus file that contains all positions. All positions that had low DP score in more than 30 samples were marked as blind spots.

We have identified that the "Illumina blind spots" in Mtb consists of 138,977 individual positions, in 748 locations (many of the positions are consecutive, hence providing a range within the genome), which is roughly 3.5% of the genome. Those blind spots fall within 293 different genes, 86 of which are highly variable PE/PPE genes, and six are pks genes, which are associated with virulence. In addition, nine esx, ecc, and esp genes in the "blindspots" are part of the mycobacterial Type VII secretion system, which is instrumental to Mtb's pathogenicity, and are not well characterized.

The list of the blind spots provided in this study is an important resource for the tuberculosis research community in interpretation of genomic data produced by Illumina short-read sequencers. We believe that GWAS and Phylogenomic studies can benefit from these results the most.

500 4:00 pm

Intersection of Genotype and Phenotype: Informing Predictive Models Rebecca de Wardt, Cell and Molecular Biology (M)

Genotypes offer insight into phenotypic expression, but there exists a gap in uncovering the complete metabolic abilities of the organism due to homology dependent annotations, limited databases, sequencing errors and contig assembly errors. A high throughput method to experimentally test genotypes is needed to accommodate the exponential increase in DNA sequences. Current phenotype studies are limited to a few traits. My research applies a high-throughput approach to analyze 154 phenotypic traits of bacteria. I aim to create a pipeline that will investigate the genetic basis of varying phenotypes of highly similar species. Here, we start the analysis by comparing gene content of 15 marine bacteria and their phenotypic profiles for 71 carbon and 23 nitrogen sources. Isolated marine bacteria were individually cultured; whole genome sequencing was completed on each isolated bacterium using Illumina MiSeq. Genomes were annotated with Rapid Annotation using Subsystem Technology (RAST), which identified an average of 5.082 coding sequences. RAST states these bacteria are Vibrio or Shewanella spp.

The genomes had an average of 1,419 hypothetical proteins, and my research could help identify these unknown genes. Analysis of genes present, using Bray Curtis clustering, showed the genomes divided into 3 major clades with 10 genomes sharing greater than 90 % similarity. Distance-based redundancy analysis (db-RDA) comparing gene content, demonstrated that hydroxymyristoyl-dehydratase, hydrogenase nickel incorporation-associated protein HypB, 1-4 dihydroxy-2-naphthoyl-CoA-hydrolase, and aclytransferase family protein attributed to variation. However, when phenotypes of the bacteria were compared, a different clustering pattern occurred. Bray Curtis clustering of phenotypes showed only 80 % similarity for 11 bacteria with 2 major clades. The db-RDA revealed that carbons including pyruvate, salicoside and L-methionine; and nitrogen species including beta-phenylethylamide, contributed to variation between bacteria. No compound tested was utilized as a sole carbon or nitrogen source by all the bacteria. Several carbon sources showed no growth, but at least one bacterium grew on all nitrogen sources. The discontinuity between phenotype and genotype, suggests that some of the hypothetical genes could be contributing to the phenotypes we describe. The data has already improved predictive growth models and will aide in bioprospecting efforts to identify commercially useful microbes.

501 4:00 pm

The Effects of Manipulating Expression of Thin, Oxen, Hsp23, and Hsp60 on Muscle Structure and Function in Wild-Type and Inclusion Body Myopathy-3 Muscle

Kimberley Manalo, Cell and Molecular Biology (M)

Inclusion body myopathy-3 (IBM-3) is a rare, dominant human disease characterized by progressive degradation of skeletal muscle caused by an amino acid substitution from glutamic acid at position 706 to a lysine residue (E706K) in myosin heavy chain type IIa. We created a transgenic Drosophila model that mimics the human disease by expressing the analogous mutation E701K. Homozygotes display thermally unstable myosin, progressive myofibrillar degradation, and myofibers with autophagic vesicles and membranous inclusions. To identify aggregated proteins within inclusions, we extracted insoluble proteins from indirect flight muscle (IFM) of young and old IBM-3 homozygotes and age-matched controls. Quantitative iTRAQ proteomic comparison completed at Johns Hopkins University revealed that six proteins were over-represented and twelve proteins were under-represented in the protein aggregates in the mutant flies at both ages. These proteins serve structural, metabolic, protein folding, protein turnover, signaling, synthesis, or transcription roles. We hypothesize that a) these proteins are critical in wild-type muscle development and function and b) altering their expression level will affect the IBM-3 heterozygote (E701K/+) phenotype. To address this, we are using the UAS-GAL4 system to modulate expression of the identified genes in the wild-type and E701K/+ IFM and assessing flight ability. IFM-specific driver lines (88F-GAL4 and fln-GAL4) were crossed with RNAi lines to knock-down each gene. Flight was impaired in young wild-type flies with the 88F-GAL4 driver coupled with knock-down of CG8764 (oxen) or CG15105 (thin). Further, over-expression of CG4463 (hsp23) and CG12101 (hsp60) yielded a progressive decline in flight ability. Our data indicate that thin, oxen, hsp23, and hsp60 are important for muscle function. We are now assessing structural changes in the wild-type muscle and examining effects in E701K/+ mutants. Overall, these studies will lead to an understanding of the roles that specific aggregation-prone proteins play in normal and diseased muscle structure and function.

502 4:00 pm

Annotating the M. Tuberculosis Hypotheticome: Updating Gene Annotations with Unspecific or Absent Products via Literature Review

Alyssa Zlotnicki, Bioinformatics & Medical Informatics (M)

The M. tuberculosis (Mtb) reference genome, H37Rv, comprises a predicted 4,111 genes. Of these, 1,057 are listed either in "unknown" or "conserved hypotheticals" functional categories on TubercuList, the most cited but 4 years outdated annotation source for Mtb. Additionally, we have determined 668 genes in other functional categories have ambiguous annotations. We define these 1,725 genes as Mtb's "Hypotheticome". Our manual curators have updated the functional annotation of these genes based on cutting-edge publications. Additionally, we compared gene products from our manual curation to their respective UniProt annotations in order to provide the most comprehensive and accurate annotation to date.

TubercuList annotations were extracted for all Hypotheticome genes and converted into GenBank's feature table format (.tbl). Each gene was searched in Google Scholar using its Rv number. The search only included primary research articles published since 2010, excluding patents and non-English papers; articles published earlier were reviewed if cited in later publications. Upon discovery of evidence warranting new product annotation, the gene's .tbl file was updated, following NCBI's annotation guidelines. Additional information describing the function of the gene's product but not specific enough to describe the protein product's exact mechanism was annotated in the note field. Each gene's analysis was performed by two curators independently. A third curator resolved annotation conflicts. The resulting annotation was compared to UniProt entry for the product. In conflicting cases, annotations derived from more rigorous experimental evidence were retained.

Of the 1,725 genes, 244 (117 from "unknown" and "conserved hypotheticals" categories) were annotated with new products and 438 additional genes were annotated with functional notes. In our UniProt comparison, approximately half the genes had a concurring annotation with clear specificity differences, ~40% had concurring annotation with similar specificity levels, and ~10% had results discordant between the two.

Nearly 40% of the 1,725 Hypotheticome genes were given at least some new functional annotation, with 14% receiving a product annotation. This greatly decreases the information void regarding Mtb's genome. New information gained by this manual annotation is vital to progression of genomic or genetic Mtb research, as it provides insight into functional implications of discovered mutations.

503 4:00 pm

Regional patterns in coral reef microbial community structure

Douglas Naliboff, Molecular and Cell Biology (M)

Coral reef microbes are influenced by numerous physical and biological factors; though some research has highlighted significant correlations between the composition of primary producers (corals and algae) present on the benthos and microbial community structure in the overlying water column. To investigate geographic variation and anthropogenic influences on reef-associated microbes, seawater samples were collected from 89 reefs located in four different regions of the Pacific and compared using shotgun metagenomic sequencing. These samples were collected in partnership with the Pacific Reef Assessment and Monitoring Program (RAMP) lead by NOAA CRED from 26 islands or atolls comprising the Hawaiian Islands, the Mariana Archipelago, American Samoa and Pacific remote island areas (PRIA). Reef sites were categorized by formation as carbonate based atolls (low) or volcanic islands (high), inhabited or uninhabited, and by geographic region. Interestingly, reef associated microbial communities correlated best with region and did not show significant grouping based on anthropogenic stressors due to inhabitation or by island formation. Bacterial phyla that were significantly enriched by region include Alteromonadales in the Marianas, Actinomycetales on remote atolls, and unclassified Alphaproteobacteria in American Samoa. Future analyses will focus on identifying metabolic functions that demonstrate regional patterns or correlate with specific bacterial phyla.

504 4:00 pm

Phenotypic analysis of 20 marine Vibrio spp. isolated from kelp forests offshore San Diego, California

Tucker Lopez, Environmental Health (M)

Marine microbes aid in the nutrition, reproduction, chemical defense, and immunity of associated organisms in marine ecosystems. However, the emergence of metabolic strategies involved in environmental adaptations by bacterial ecotypes is still unclear. Our research established the phenotypic profiles of Vibrios strains phylogenetically related to Vibrio splendidus, Vibrio cyclitrophicus, & Shewanella sp. as a proxy of their metabolic strategies used to convert carbon and nitrogen sources. The strains were isolated from Kelp forest regions offshore San Diego, California. The growth ability of each bacteria was tested on 72 carbon and 24 nitrogen sources.

91% of the Vibrio studied grow in Alpha D-Glucose, D-Mannose, D-Glactose, Glycerol, Lactate, L-Glutamine, & Trehalose Carbon sources. 50% of all Virbrio grew in Adonitol, D-Xylose, L-Aspartic Acid, and Putrecine Carbon sources. Furthermore, none of the Virbrio studied grow in Oxalic acid. 87% of the vibrio studied grew in Cytidine Nitrogen Source, 50% in Adenine, Biuret, Guanidine, Histamine, L-Pyro-Glutamic acid Nitrogen sources. The lowest growth was observed in Beta-Phenylethylamine and L-Glutathione Nitrogen sources with 41% growth of the Vibrio studied. It is hypothesized that microbial strains isolated from higher anthropogenic disturbed areas will show increased carbon and nitrogen utilization.

As a result of this study, we expect to better predict the changes that will occur in microbial communities with different anthropogenic influences which has implications on the health of the associated environment and macro-organisms. This study is relevant as anthropogenic perturbations continue to increase in frequency and magnitude worldwide.

Session E-7

Poster: Behavioral & Social Sciences P14 **Friday, March 3, 2017, 4:00 pm** Location: Montezuma Hall

505 4:00 pm

Autonomic Indices of Emotional Responsivity in Binge Drinkers

Morgan Slauter, Psychology (U)

High levels of alcohol consumption are prevalent on college campuses. The pattern of heavy episodic drinking, also termed binge drinking, is associated with increased depression, anxiety, memory deficits, and alcohol-induced blackouts. However, the physiological underpinnings of such findings are poorly understood. Electrodermal activity (EDA) has been shown to be a direct measure of autonomic sympathetic nervous system engagement during arousal. The main goal of the present study was to examine EDA indices of physiological arousal to emotional stimuli as a function of binge drinking.

Sixty-three young, healthy individuals (31 female) were grouped based on their drinking patterns. Participants who reported having at least 5 binging episodes (6+/5+ drinks for males/ females within 2 hours) in the last 6 months were classified as Binge Drinkers (BD, n=33), and those who reported no more than one binge episode in the last 6 months were classified as Light Drinkers (LD, n=30). They took part in an emotional rating task while their EDA was recorded. They were presented with a series of positive, neutral, negative, and erotic pictures from the International Affective Picture System, and were asked to rate each picture on how it made them feel.

The data were epoched for each trial based on stimulus onset. Peak amplitude, latency, and overall mean tonic skin conductance were derived in response to each trial and analyzed with mixed model ANOVAs with a 2 (group) by 2 (gender) by 4 (emotional valence) design. An initial analysis indicates a main effect of emotion with a higher response magnitude to negative and erotic stimuli. Males were found to be more responsive to emotional arousing stimuli relative to the neutral stimuli than females. Even though the preliminary analysis did not show an effect of binge drinking on EDA, correlational analysis indicates that higher levels of drinking are associated with diminished autonomic responsivity to emotional stimuli.

506 4:00 pm

High-intensity (binge) drinking is associated with altered neural oscillations in young adults **Rifqi Affan, Psychology (U)**

High-intensity alcohol consumption, also termed binge drinking, is particularly common among young adults and contributes to a wide range of health problems and cognitive deficits. However, not much is known about enduring changes in neural activity associated with high-intensity drinking. Studies of resting EEG have provided evidence for altered spontaneous neural oscillations in acutely intoxicated individuals and chronic alcoholics, but this method has not been used to study the underlying neurophysiological implications of binge drinking. The current study was designed to examine the neural oscillatory profiles of individuals with and without a history of binge drinking during eyes-open and closed (EOC) wakeful rest. Sixty-one healthy, right-handed young adults (30 females, mean age $[\pm SD] = 23.4 \pm 3.4$ years) filled out guestionnaires regarding their alcohol intake and personality traits. Binge drinkers (BD) (N=30) reported 11.5 ± 8.4 binge episodes during 6 months preceding the study. A binge episode was defined as consuming 6+/ 5+ drinks for males/females within 2 hours. Light drinkers (LD) reported 0.1 ± 0.3 binge episodes and had lower levels of alcohol consumption overall. BD also reported higher scores in anxiety, depression, and impulsivity. Continuous EEG signal was recorded from 64 scalp electrodes as participants engaged in EOC for 4 minutes. The wideband signal was analyzed with a multitapered Fast Fourier Transform and segmented into canonical frequency bands including theta (3 – 7 Hz), alpha (7-13 Hz), and beta (15-20 Hz). Even though alpha power did not differ between groups, binge drinkers displayed significantly slower alpha peak frequency and greater theta power compared to light drinkers. These results are consistent with evidence of EEG slowing in individuals diagnosed with neurodegenerative symptoms, traumatic brain injury, and attention deficits. Moreover, beta power was higher in BD compared to LD, indicating that binge drinking could be linked to a disturbed excitatory-inhibitory homeostasis. Taken together, these results indicate that heavy episodic alcohol consumption in young adults is associated with persistent, maladaptive changes in the brain that may contribute to impaired cognitive capacity.

507 4:00 pm

Choline as a Treatment for Fetal Alcohol Spectrum Disorders: Effects on Hippocampal Brain-Derived Neurotrophic Factor

Kim Potter, Psychology (M)

Alcohol consumption during pregnancy can lead to birth defects ranging from observable cranio-facial malformations to cognitive dysfunction, effects known as fetal alcohol spectrum disorders (FASD). FASD are an important public health concern, as current prevalence rates in the U.S. are estimated to be between 2% to 5%. Prenatal alcohol exposure can damage

brain structures, including the hippocampus. Alcohol-induced disruptions in hippocampal plasticity may contribute to the long-lasting cognitive impairments observed in individuals with FASD. Previously, we have found that supplemental choline, an essential nutrient, can attenuate some behavioral deficits in rats related to developmental ethanol exposure. Others have reported that perinatal choline supplementation in typically developing rats boosts hippocampal BDNF, a brain chemical essential for neuronal plasticity. Therefore, we hypothesized that the benefits of perinatal choline supplementation following prenatal alcohol exposure might be due to choline's effects on BDNF in the hippocampus. To investigate this, we used Sprague-Dawley rats in a $2 \times 2 \times 2$ (sex) design (n's = 9/group). Subjects were intubated with either 5.25 g/kg/day alcohol or a sham intubation from postnatal days (PD) 4-9, a brain development period equivalent to the human third trimester of pregnancy. Subjects were then injected with either 100 mg/ kg/day of choline chloride or saline from PD 10-30. From PD 31-34, activity was monitored in an open-field chamber for 60 minutes/day. Hippocampal tissue was then extracted on PD 35 and BDNF was analyzed using Western blotting. Ethanol exposure was associated with hyperactivity within the open field. Importantly, choline attenuated these alcohol-related alterations in activity. In addition, BDNF levels were significantly decreased by about 20% in subjects exposed to ethanol, an effect that was significantly mitigated with the choline supplementation. In fact, BDNF levels of ethanol-exposed subjects treated with choline did not differ from that of controls. BDNF was not altered by choline among controls. Our results indicate that choline may improve cognitive abilities following early alcohol exposure by increasing BDNF and enhancing hippocampal plasticity. These findings provide important information on the effects of choline on brain development, as this nutritional intervention is translated as a potential treatment to clinical populations with FASD.

508 4:00 pm

An Analysis of Sociodemographic and Clinical Differences Among Civilians, Active Duty and Veterans in a Driving under the Influence (DUI) Sample Jennifer Head, Social Work (M)

Intro: Historically, U.S. military culture has had a complicated relationship with alcohol, with use serving as a cohesion ritual, coping strategy, or test for proving one's reliability. Studies have found higher rates of heavy and binge drinking among active duty service members when compared to civilians. Higher rates of alcohol use in military populations are of particular concern as U.S military engagement declines overseas and service-members return to domestic communities. Although military-civilian differences in prevalence rates of alcohol misuse are well documented, less is known about how they compare on Driving Under the Influence (DUI) arrests. Objectives: The current study explores whether military/civilian status is related to alcohol use severity, psychosocial problems or

chronic disease conditions among participants in a large DUI program. Methods: Participants were 19,639 individuals enrolled in a DUI program in Southern California during 2007 to 2014. Civilians comprised 87.5% of the sample, with 4.0% active duty, and 8.5% veterans. Results: With civilians as the reference group, a multinomial logistic regression with all significant bivariate correlates included in the model showed active duty clients were younger and more likely to be earning wages than civilians, whereas veterans were older and less likely to be earning wages. Active duty and veterans were more likely to be male, Black, married, divorced or separated than civilians, but less likely to be Asian. Veterans were less likely to be Hispanic than civilians. Active duty were less likely to have a history of anxiety and veterans were more likely to report hypertension and sleep disorders than civilians or active duty. Active duty and veterans were more likely to report prior alcohol treatment, but were the lowest risk groups with one alcohol severity index (CAGE). However veterans were the highest risk group for another index (Audit-C). Active duty were more likely than civilians or veterans to have first-time convictions. Active duty were less likely to report drinking for effect, perceive their drinking as dependent, or have alcohol-related domestic violence. Discussion: This study highlights differences between civilian and military-connected DUI program participants which may be helpful in tailoring culturally competent DUI program interventions.

509 4:00 pm

Spanish and English Speaking Latino Emergency Department Patients: Alcohol Use Characteristics and Effects of Brief Intervention

Fabian M. Martinez, Social Work Administration/ Healthcare Management & Policy (M)

Screening, Brief Intervention and Referral Treatment (SBIRT) is an evidence-based intervention model used to identify, reduce, and prevent hazardous use of alcohol and illicit drugs. SBIRT is often utilized in Emergency Department (ED) and primary care settings because such departments present an opportune moment to engage patients in conversation about substance use, as they are already there for health related purposes. Few studies have examined alcohol related differences between Latinos whose primary language is English compared to those whose primary language is Spanish, or investigated the effects of SBIRT when delivered in Spanish to primarily Spanish-speaking patients. This study describes the sociodemographic and alcohol-related characteristics of Spanish and English speaking Latino patients screened for alcohol use in ED settings, and evaluates the effects of Brief Intervention on those identified as hazardous drinkers. A total of 24,319 Latino patients were interviewed in 8 different ED settings throughout San Diego County. Of this sample, 61% preferred to do the interview in English, while 39% preferred to be interviewed in Spanish. Those preferring Spanish were slightly more likely to be female, older, and from Mexico than the English preferring patients. Spanish speaking patients

were more likely to have less than a high school education and report annual incomes of less \$9,999/year. However, they were less likely than their English-speaking counterparts to report past 30 day alcohol use, binge drinking, and alcohol use to intoxication. Females in both language groups were less likely than their respective male counterparts to report drinking in the past 30 days, binge drinking, and alcohol to intoxication. A total of 219 screened Latino patients received a Brief Intervention in the ED in their preferred language, and completed a six month self-report follow-up assessment (19% Spanish; 81% English). Controlling for gender, analysis showed both groups significantly reduced their alcohol use and days of intoxication about equally. Results suggest that although Latino ED patient groups may differ somewhat on sociodemographic and alcohol-related measures, a linguistically appropriate alcohol Brief Intervention in the ED may have broad benefits.

510 4:00 pm

The relationship between self-perceptions of alcohol intoxication and breath alcohol concentration (BrAC)

Natasia Courchesne, Joint Doctoral Program in Interdisciplinary Research on Substance Use (D)

Purpose: The purpose of this study was to test the concurrent validity of a single measure of self-perceived alcohol intoxication using data from three different field research studies in three different settings examining drinking behaviors among late adolescents and young adults on a college campus, at college parties, and in a bar district popular with college students. Method: We utilized data collected as part of three separate field studies examining the etiology of college student drinking behaviors for this study. In each study participants were asked to indicate how intoxicated they felt at the moment (1 = no buzz, 2 = slightly buzzed, 3 = a little drunk, 4 = verydrunk) as well as to provide a breath alcohol concentration (BrAC) sample as an objective measure of alcohol intoxication. Given the nested nature of the data (i.e., participants nested within groups, parties, and bars), multilevel modeling was used to account for the non-independence of observations in each of the three datasets. Results: After controlling for the grouping effect in each dataset, the results indicated a significant relationship between the measure of self-perceived intoxication and BrAC for the college campus data (Beta = 0.770, p<0.001), the party data (Beta = 0.494, p<0.001), and the bar data (Beta = 0.630, p<0.001). Conclusions: Overall, the measure of self-perceived alcohol intoxication was moderately correlated with BrAC in each of the study settings. These results suggest that this single measure of self-perceived alcohol intoxication had good concurrent validity and could serve as an indicator of intoxication when objective measures of alcohol intoxication such as BrAC are not feasible or possible to collect.

569 4:00 pm

Development of a photocatalyst-light activating layer hybrid structure for the evolution of hydrogen gas

Nicholas Williams, Chemistry, (M)

With the depletion of fossil fuels and an increasing rate of worldwide energy consumption, a cleaner source of renewable energy is essential to meet energy security requirements as well as rescuing many fragile ecosystems on earth. Hydrogenase mimics pose potentials to solve this issue, by mimicking the biological active centers that produce hydrogen gas as a fuel. In our novel strategy, Fe₂(CO)₆(SC₆H₄OH)₂, a hydrogenase photo catalyst, is chemically grafted to the Si (100) surface. The modified surface contains a monolayer of catalyst thus forming a catalyst-semiconductor hybrid structure. The attachment of the catalysts has been confirmed via contact angle measurements and linear sweep voltammetry (LSV) and will be tested using X-ray photoelectron spectroscopy (XPS). The electrodes catalytic ability was tested using LSV and were found to be significantly more catalytically active. In the future, the efficiency of this Hybrid system will be measured using gas chromatography(GC) to determine the rate of Hydrogen production.

Session F-1

Exhibit Friday, March 3, 2017, 9:00 am Location: Montezuma Hall

511 9:00 am

Plexus: A Study in Nonlinear Storytelling Cathy Nguyen, MFA, Graphic Design (M)

Plexus (2016) is an artist's book that weaves the voices of two stories: *The Garden of Forking Paths* by Jorge Luis Borges (1941) and Lewis Carroll's *Alice's Adventures in Wonderland* (1865), disparate works that share an affinity for nonlinear storytelling.

In Borges's detective short story, space displaces time as the protagonist encounters a labyrinthian book and a labyrinthian garden, while the reader experiences an illusory narrative that takes us forward and backward between insiders and outsiders of the story. Meanwhile, Carroll's beloved story of Alice portrays a young girl in a curious world where language, communication, and logic fail in her attempts to find meaning in riddling situations. Both of these stories challenge assumptions about ourselves, our place in the universe, and the intelligibility of the material universe itself, underscoring how the complex nature of life eludes immediate interpretation and definitive resolve.

Inspired by these contemplations, *Plexus* was designed with triangular shaped pages that reconfigure into multidimensional

pathways of reading that prevent the work from being accessed the same way each time it is attempted to be read; it becomes dependent on reader participation, choices, and engagement. *Plexus* aims to emphasize the multilinear possibilities of reading, due to its fluid design of structure and layout which defy traditional Western processes of top-down, left-to-right reading. The hope is that readers experience a proactive reading process that provokes unexpected and even imaginative responses, reminiscent of Borges's and Carroll's works which destabilize rigid linear conventions.

Digital and traditional methods of printing were paired to produce *Plexus*. Metadata from photography was digitally manipulated to achieve a colorful effect, while text was printed by hand using polymer plates and letterpress. Quotes from *The Garden of Forking Paths* are represented in the typeface Template Gothic, designed by Barry Deck in 1990 as one of the first digital fonts to embrace the aesthetic of grunge and imperfection, coinciding with the disorderly nature of *Plexus*. Meanwhile, quotes from Alice are transcribed in Futura, designed in 1927 by Paul Renner and well-known for its geometric proportions, parallelling *Plexus's* triangular pages which were also bound by hand.

Session G-1

Performance Arts Friday, March 3, 2017, 1:30 pm Location: Montezuma Theater

512 1:30 pm

Helen Tamiris: Patriot Choreographer David Watson, Musical Theatre (M)

The purpose of this research is to articulate significant contributions Helen Tamiris made in the fields of Modern Dance and commercial Musical Theatre. The goal is to increase her visibility and presence in history. By reading both early and relatively modern essays about her, as well as newspaper articles reviewing her work, a chronological biography of her performances, and an unfinished autobiography, the research has revealed a vibrant, scrappy, headstrong individual of enormous creative ability. Helen Tamiris's choreography focused on patriotism, social change, political satire, and equality for the African American. Tamiris remains relevant to social movements significant in today's theatre. She believed in casting dancers of color if they were the best dancers for the job. She believed in federally funded arts programs. She believed that dance should be an integral and equal part of a story when utilized in a musical. The research shows her work as both choreographer and activist were high-profile and effective for the time. Re-staging or reviving the works of Helen Tamiris could prove to be significant as the social and political themes of the 1930's-1950's run parallel to those of today.

513 1:50 pm

The 21st Century Voice Teacher: A Perspective on Current Musical Theatre Training in Higher Education Kimberly Moller, MFA Musical Theatre (M)

Voice lessons are an important part of advanced training in musical theatre at the college level. For classical study, it is standard to receive one hour of voice lessons per week for a Bachelor of Music: Vocal Performance degree, and most programs offer additional coaching times or studio classes with guest speakers that primarily focus on style, repertoire, diction, and ornamentation. As in classical study, voice lessons in musical theatre are meant to be the study of the individual's instrument, including focus on breath, different kinds of resonance (including what is referred to as belt, legit, and "mix" styles, vowels, posture and alignment, and, in general, the function of the vocal tract physiologically. Musical theatre singing is an entirely different use of laryngeal behaviors and vocal tract adjustments than classical vocal production, yet many musical theatre training programs offer half-hour lessons with a professor from the school of music who may not have specific training in this style of singing. The research I have conducted is at the suggestion of Mary Saunders-Barton, a major contributor to this field as the founder of the only MFA in Musical Theatre Voice Pedagogy program in the country for teaching the teacher.. The surveys I have personally conducted of members of The Musical Theatre Educators Alliance focus primarily on the current study and depth of college-level voice instruction, the instructors themselves, and information I have gathered from the changing perspectives of voice science professionals and of The National Association of Teachers of Singing regarding musical theatre instruction. I will also provide demonstration as a professionally cross-trained singer and voice teacher over the last 8 years.

514 2:10 pm

Cultivating Social Emotional Growth through Theatre and Performance Kimberly King-Smithson, Theatre Arts (M)

Hypothesis: Educating the whole student means providing experiences and opportunities for students to work toward achieving 1) self-awareness, 2) self-management, and 3) social awareness as they develop 4) relationship skills and 5) responsible decision-making. These five components are encapsulated in a strategy intended to help students develop aspects of their character. Taken together, the five components are known as Social Emotional Learning (SEL). In my study, I observed students from a variety of backgrounds collaborate on the creation of *Follow Us Here* directed by Jess Humphrey and produced by Jean Isaacs/San Diego Dance Theater for Trolley Dances. My study examines the collaborative process used by students as they negotiated with one another to produce a site-specific performance.

Methods: As dramaturg for this dance performance, I observed SEL used as a strategy that guided artistic collaborations as it developed students' skills and capacities. During the 2016 Trolley Dance rehearsals and performances, I witnessed students developing these skills during rehearsals. I use anecdotes from rehearsal to showcase the implementation and impact of each of the five SEL principles.

Essential Outcomes: Fostering collaborative interaction builds the foundation humans require to create alliances and achieve common ground. One person engaged in several collaborative endeavors is one person in the center of several networks, working to keep a group together, which is the experience of social awareness. Engaging in social emotional learning offers both the practitioner and mentor the opportunity to be simultaneously instructed and strengthened.

Summary: Taking the 2016 Trolley Dance produced by SDSU's Department of Music and Dance as a case study, my paper examines the effectiveness of using SEL as a guiding set of principles to foster collaboration among student artists. Using my own classroom of visual and performing arts students as a further illustration, I argue that the use of SEL in the production of a performance leads to more engaged and confident students who are willing to take risks to benefit the performance community.

515 2:30 pm

A Sequential Approach to Developing Musical Literacy in Beginning Violin **Quyen Nguyen, Music Performance (U)**

516 2:50 pm

Conference Showcasing: Creating Financially Sustainable Music Ensembles Gustavo Alcoser, Latin American Studies (M)

517 3:10 pm

To See or Not to See Aubrhe Yruretagoyena, Dance (U)

518 3:30 pm

Everyday American Women Anna Conkey, English, Journalism (U)

Session H-1

Oral Presentation: Interdisciplinary OR2 Saturday, March 4, 2017, 9:00 am Location: Pride Suite

519 9:00 am

Spatial Language and Thought in Tseltal Mayan: New Evidence from a Transitive Inference Task Dianna Hurtado, Psychology (U)

Does the language we speak affect our thoughts? In this paper, I examine the linguistic relativity hypothesis in the area of spatial language and cognition. Languages use different frames of reference (FoR) to talk about where things are. For example, English-speakers use an egocentric system (left/right) whereas Tseltal-speakers (Mayan, Mexico) use a geocentric system instead (uphill/downhill). These differences are argued to affect how speakers interpret, store and retrieve spatial information. Most studies use the properties of different FoR under rotation. Speakers view an array at one table, such as three toy animals in a row, and then turn 180° to face a second table where they are asked to recreate the "same" array. Crucially, after turning, there are two equally correct solutions: one can rotate the array egocentrically or translate it geocentrically. Results from more than 20 languages found a striking correlation between task performance and language use (Levinson, 2003; Majid et al., 2004; Pederson et al., 1998). Not all researchers, however, agree that this shows anything about speakers' nonlinguistic spatial cognition due to the open-ended nature of the tasks. Using unambiguous tasks, Li et al. (2011) found that Tseltal and English-speakers alike were able to reason equally well using either reference frame. The present study strengthens and extends this work by testing 10-12 year-old Tseltal-speaking children on a more difficult and robust task that uses the transitive property to show the relationship between three objects, revealed two at a time across two tables (e.g., if A is left/north of B, and B is left/north of C, then A is left/north of C). The task uses models of fronted buildings to create two matched conditions: In the egocentric condition, the buildings rotated to face the children across both tables. In the geocentric condition, they did not. Our results showed no difference in performance across the two conditions (F(1,23) = 1.67, p = .21). If anything, the children did better in the egocentric than the geocentric condition (66.7% correct vs. 52.5%), arguing against linguistic relativity. I am currently testing a Spanish-speaking comparison group on an adaptation of this task.

520 9:15 am

Searching for High-Spin /Low-Spin Conic Intersections in Cyclic and Acyclic Organic Structures Harrison Pearce, Physics (U)

The electronic state of a molecule depends on the distribution of the electrons, and also on the sum of the electron spins. More than one spin is possible for any geometry of the molecule, but we usually assume that the lowest spin is the most stable. High-spin and low-spin conic intersections exist when high and low-spin states of the same structure have the same energy level (as opposed to one spin state always being more energetically favorable at all the geometries we're looking at). Some likely candidates for containing this spin intersection are cyclic and acyclic C5H4, C5H5 and C5H6. In order to find the locations of the spin crossings in these molecules, the energy levels of the candidates for spin crossing were assessed in Molpro (a quantum chemistry package) using the CCSD(T)-F12a level of theory along with a cc-pVDZ-F12 basis set to assess the energy levels of cyclic and acyclic organic molecules and radicals in low and high spin states. These calculations can suffer from errors when different spin states are similar in energy, so they was followed by MCSCF and MRCSID calculations in order to test the validity of the CCSD(T) wavefunctions. Several of the molecules studied were found to have electronic states where these conic intersections could play an important role in their chemistry.

521 9:30 am

Methane Mitigation: Testing Immobilized Methylomicrobium alcaliphilum 20ZR Efficiency Richard Hamilton, Biology (U)

Global climate change is driven by the emission of greenhouse gases, including CO_2 and methane. The damaging potential of methane is widely recognized, but the only solution we currently apply is gas flares, which waste energy and cause air pollution.

Biological methane conversion is the main mechanism that controls methane flux in nature and it holds great potential for global warming stabilization and possibly reduction. Here I will discuss our most recent research efforts in developing bio-based approaches to methane mitigation. Here, as an alternative solution, we propose to explore the applicability of living emission abolish filters (LEAFs) for the removal of methane from the atmosphere. LEAFs are based on the unique ability of halophilic methanotrophs to sustain dryness by capturing and producing water from methane. LEAFs are envisioned as arrays (microfibers) of immobilized active cells, which could represent a cheap, simple, scalable, cartridge-like system for capturing methane.

The methanotrophic bacterium used in this experiment is *Methylomicrobium alcaliphilum* 20ZR. The strain 20ZR is being developed for a variety of biotechnological applications

and for this project we tested the activity of immobilized 20ZR culture in order to be applied to a filtration system in the future.

M.alcaliphilum 20ZR was first grown in a bioflo-bioreactor with methane. The biomass was then collected and transferred to Whatman 17 CHR filters. The filters where then placed in sealed chambers that were connected to bluesense sensors that detected the level of oxygen and methane within the chamber over a period of time. Methane was added to the chamber continuously. This allowed us to measure the amount of methane consumed by *Methylomicrobium alcaliphilum* 20ZR when there were immobilized on Whatman 17 CHR filters. The immobilized cells showed methane consumption rates similar to liquid cultures. Currently we are in the process of extending the cell life of *Methylomicrobium alcaliphilum* 20ZR on Whatman 17 CHR filters in order to create an efficient methane mitigation system. If successful, the method will present affordable, small-scale methane mitigation technology.

522 9:45 am

Exploring Academic Identity and Post-Graduation Anxiety Among College Students

Courtney Hook, Communication Studies (M)

This study examined the relationship between the strength of academic identity among students and concerns surrounding post-graduation. Academic identity was found to be negatively correlated with post-graduation anxiety. Therefore, students who have cultivated a strong identity within academic are less concerned about graduation and what life will look like after leaving college. This study is the first of its kind in an attempt to bridge the gap between academic identity and graduation anxieties, and is therefore critical to be considered by scholars and educators within higher education.

523 10:15 am

Hustlin' Campus Resources: Understanding Persistence among Men of Color in the Community College

Bryan Osorio, Criminal Justice (U)

Student success research on the experiences and outcomes for men of color in postsecondary education is often conducted from a deficit perspective (Harper, 2010). To rectify the deficit perspective specifically for men of color in the community college, the experiences of these men need to be examined. Variety and availability of on-campus resources are influential factors in continued persistence among males of color in the community college.

This study utilized a qualitative phenomenological approach (Moustakes,1994) to understand the lived experiences of community college male students of color (e.g., African American, Latino, Southeast Asian, Pacific Islander, Native American). Data collection occurred during Spring 2015 and Fall 2015. Recruitment at each campus included the support of key campus personnel who promoted the focus group via flyers on campus and announcements during classes. Per IRB, all participants consented to audio-recorded sessions and were assured confidentially by our project team. Participants were given gift cards to campus bookstores and/or coffee shops as an incentive. Data were collected via 16 focus groups and five one-on-one interviews, totaling 121 students enrolled at one of four community colleges in California. Of these, 43% self-identified as African American/Black; 30.6% as Mexican/ Mexican American, Hispanic, Latino, or Chicano; and 13.2% as multiracial. Transcribed data was uploaded to Dedoose—a qualitative data analysis software program that enables researchers to work collaboratively on analyzing a dataset.

Preliminary analyses illustrated programs and people that supported participant persistence, including (1) Extended Opportunity Programs and Services (EOPS), (2) culturally similar peers, and (3) professors. EOPS provided students with courses on time management, discounts on books and bus passes, access to counselors, and priority enrollment. Secondly, participants shared the significance of engaging with culturally similar peers as important for their sense of belonging. Lastly, the holistic nature of professors enabled students to approach and seek their support.

To combat the deficit perspectives of men of color in community colleges, it is critical to analyze the impact of on-campus resources that support their persistence. Through the different services and programs offered by EOPS, professors, peers, insight can be gained into what resources work and what resources are needed.

Session H-2

Oral Presentation: Health Nutrition & Clinical Sciences OR2 **Saturday, March 3, 2017, 9:00 am** Location: Park Boulevard

524 9:00 am

Sensory Weighting of Posture: Implications for Fall Risk in Parkinson's Disease Mason Hearn, Kinesiology: Applied Movement Science (M)

The purpose of this study was to investigate the sensory weighting of postural control and fall-risk in people with Parkinson's disease (PD). 70 PD patients, 34 older adults and 20 young adults volunteered to participate in the study. The PD patients were further categorized into low and high fall risk (LFR, HFR) based on normative assessment criteria of an eye's closed static balance test. Patients greater than 2 standard deviations from the average score of the normative database were considered HFR. All subjects performed a static balance assessment using the better balance test. Testing consisted of 1 familiarization and 3 experimental trials of quiet standing with feet shoulder width apart and hands on the hips. This was performed twice: once with eyes open (EO) and once with eyes closed (EC). Each trial lasted 20 seconds during which the total center of pressure (COP) sway, COP antero-posterior sway, COP medio-lateral sway excursions, velocities and 95% Cls of the COP area were quantified. Postural sway increased in all directions during the EC condition for all groups. A Romberg ratio (EC/EO) was calculated for all the dependent variables. PD-HFR patients exhibit significantly (P < 0.05) larger Romberg ratios all directions compared with those PD-LFR, older adults and younger adults. In addition, PD-HFR patients exhibit significantly (P < 0.05) larger Romberg ratios for total COP excursion when compared with PD-LFR. Our findings indicate that PD patients at a higher fall risk are highly dependent on vision for postural control.

525 9:15 am

Religiosity and Cardiovascular Disease Risk among Sexual Minorities: Results from a Nationally Representative Sample Kalina Lamb, Psychology (M)

Objective: Hypertension is a major public health concern. Among the general population, higher levels of religiosity have been associated with lower blood pressure (BP) compared to nonreligious individuals. However, no known studies have examined the relationship between religiosity and BP among sexual minorities (e.g., gay, lesbian, and bisexual individuals). Given that many world religions promote doctrines that include negative views toward sexual minorities, it is plausible that elevated religiosity among sexual minorities may be associated with increased BP.

Methods: The current study analyzed data collected from Wave IV of the National Longitudinal Study of Adolescent to Adult Health (Add Health), a publically available, nationally representative dataset. Participants were identified as a sexual minority if they identified themselves as 100% gay, mostly gay, or bisexual, or reported same sex attraction (N = 297, 25% Male, Mean age = 28.55, SD = 1.68 years). A religiosity variable was created by standardizing and averaging responses of two items assessing attendance of religious services and religious activities. BP was measured as systolic (SBP) and diastolic blood pressure (DBP) – each measured with three 30-second interval readings, with scores equaling the average of the second and third reading. Relevant covariates were controlled for in the models (i.e., age, gender, BMI, ethnicity, income, education, smoking and alcohol use).

Results: Complex Samples within SPSS (v23) was employed to account for the weighting, clustering, and stratification. Two separate General Linear Models were conducted, with SBP and DPB entered as outcome variables. Elevated religiosity was associated with increased SBP (b = 1.29, SE = .83, 95% CI: 0.35, 2.54, t = 2.045, p = .04) and DPB (b = 1.01, SE = 0.51, 95% CI: 0.003, 2.02, t = 2.00, p = .05).

Conclusions: Previous research has found religiosity to be a protective factor from hypertension among the general population. However, the results from the current study are the first to test and find an inverse effect among sexual minority individuals. Further research may benefit from examining the interaction of sexual orientation and religiosity in predicting hypertension.

526 9:30 am

Demographic and Treatment Factors that Influence Survival Among Hemangiopericytoma Patients Rolando Barajas, Epidemiology (M)

Background: Hemangioperictomas (HPC) are classified as an extremely rare and aggressive mesenchymal tumor that arises from the pericytes of the meningeal capillaries. These tumors account for less than 1% of all central nervous system (CNS) tumors and are often histologically categorized into low-grade (grade 2) or high-grade (grade 3) neoplasms and are known have high rates of local reoccurrence/metastases after initial resection. The rarity of this tumor has allowed for only a limited number of studies to examine patient demographic and treatment involvement in overall survival among those with a grade 3 HPC. The aim of this study was to look at the associations previously studied and determine best course of treatment as well as patient demographic trends in survival.

Methods: The California Cancer Registry (CCR) was used as the data source for this retrospective study. After excluding irrelevant cases descriptive statistics of the study population was performed followed by Kaplan Meier survival analysis for overall survival time estimates by demographic and treatment variables. Bivariate analysis was done via cox proportional hazard modeling for a single variable then multivariable analysis included a cox proportional hazard model all variables found significant at the bivariate level.

Results: After excluding all irrelevant cases a total of 94 patients were identified from the registry with the majority being middle aged, female, non-Hispanic white ,married, received radiation and subtotal resection yet only a few received chemotherapy. At the bivariate level being older or divorced/widowed/separated (DWS) led to a significant worse overall survival. However, in terms of treatment those who received gross total resection with radiation as a first course of treatment had a significantly better survival than compared to gross total resection alone. In the multivariable model older age and DWS retained its worse survival status but in comparison to GTR alone those with any kind of radiation independent of surgery had improved survival yet GTR with radiation had the largest association for improved survival.

Conclusions: This study found demographic associations have not been studied previously for this neoplasm and added to the consensus that more aggressive treatment, such as using radiation as a first course of treatment could be the most beneficial for patient survival.

527 9:45 am

Evidence based Literature Review on early interventions for pregnant women to prevent caries in children

Aarti Gupta, Public Health, Biometry (M)

Purpose: This paper reviews evidence of maternal interventions, starting either during pregnancy or up to 24 months post-delivery.

Oral health interventions included a combination of clinical dental care, anti-microbial use (usually xylitol or chlorhexidine), fluorides, education, or motivational interviewing (MI) to reduce mutans streptococci (MS) bacteria in mothers and infants, and ultimately reduce early childhood caries (ECC) in young children.

Methods: A search of peer-reviewed literature (1998-2016) was conducted in Medline, PubMed, Google Scholar, Cochrane Database, and reference review. Of the 1362 initial hits, 239 unique relevant papers were identified for closer review. Sixteen studies met inclusion criteria: Educational and/or Clinical Interventions with pregnant mothers or with mothers from childbirth up to 24 months post-delivery. The primary outcomes were: Reduction in MS or caries in mothers and/or infant/child up to 24 months.

Results: There are too few and varied interventions to draw firm conclusions about the evidence collectively.

Prenatal: These studies were based on the use of different antimicrobials along with education, xylitol, and education only on primary outcomes. Reductions in maternal and child MS and ECC were observed in six of the seven interventions, suggesting some promising prenatal strategies for oral health promotion and infant caries prevention.

Post-Delivery: Some studies were based on use of antimicrobials alone, others included clinical care along with antimicrobials and one used a MI counseling approach. Effectiveness of the post-delivery maternal interventions was mixed. Across the nine studies, outcomes assessed and caries case definitions varied, which limited comparability.

Discussion: Mothers play a key role in shaping infant ECC risk. Findings suggest that Anticipatory guidance (AG) and MI are important during the prenatal and post-delivery periods. Evidence was more supportive of prenatal clinical interventions whereas post-delivery evidence was more mixed. Dental screenings and AG about maternal and infant

Oral health should be included in prenatal care, as well as during the child's pediatric well-visits. Dental care during pregnancy is safe and recommended, and can reduce maternal MS levels. Infants should visit a dentist by age one. More rigorous longitudinal intervention research is needed with mother-infant pairs to drive clinical guidelines in this area.

Session H-3

Oral Presentation: Engineering & Computer Science OR4 Saturday, March 4, 2017, 9:00 am Location: Tehuanco

528 9:00 am

Comparison of Three Methods of Simulating Wind Flow over Large Computational Domains Brady Ells, Mechanical Engineering (M)

Wind-driven wildfires are devastating natural disasters that can cause massive physical, ecological, and economic damage. Current research funded by NIST, the National Institute of Standards and Technology, is focused on studying the behavior of winds within the Rancho Bernardo Trails community, which was the victim of a wildfire in 2007. The goal of the research project is to understand the effects that Santa Ana winds have upon the spread of wildfires as the fires transition from wildlands to an urban environment.

Within the Trails community in Rancho Bernardo and the San Dieguito River Valley to the north, we have established 18 different locations monitoring wind speed, wind direction, temperature, and humidity. In conjunction with experimental data collected in the field, the research project utilizes a computer model developed by NIST called Fire Dynamics Simulator (FDS) in order to simulate wind flow and fire spread under specified conditions.

Recent testing of simplified cases in FDS has been to determine the most efficient and effective method of implementing a flow field throughout a 1km cube domain with 10m control volumes. The first method involves imposing a steady wind from one side and letting it flow freely across the domain. The second method involves a geostrophic wind, which is a wind driven by the Coriolis force and a user-defined pressure gradient. The final method involves a forcing function, which creates an average flow field from imported wind data from a single location over time.

Preliminary data from FDS is plotted in the form of wind speed and wind direction over time as well as velocity profiles in order to accurately study the behavior of the flow field. Each method is shown to have distinct advantages and disadvantages for our research purposes. More testing will need to be done to determine which method is preferred over complex terrain. Currently, the forcing function is the method used in more complex FDS runs, but integrating the Coriolis-driven flow field into future FDS runs is the ultimate short-term goal of this research project.

529 9:15 am

Assessing the potential of Fluorescence spectroscopy to track presence of contaminants in water reuse systems

Joseph Wasswa, Environmental Engineering (M)

Growing scarcity of freshwater resources is one of the driving forces behind advocating for water reuse. In order to increase the popularity and safety of water reuse projects, there is a need to develop real-time, reliable and robust sensors for water quality. Fluorescence spectroscopy has the ability to broadly discriminate different chromophoric organic compounds and it has been used before to track small microbial contamination in water. However, much remains to be understood about the capabilities of fluorescence for directly tracking of membrane fouling or other contaminants like pesticides, oil spills and pharmaceuticals and personal care products in high-quality effluents of water reuse systems. Most of the conventional wastewater treatment processes do not remove these contaminants and there is always a possibility of system failure for any system that can remove substantial amounts of these contaminants.

The overall goal of this study, therefore, is to evaluate the potential of fluorescence spectroscopy to track small changes of dissolved organic matter (DOM) due to contaminant spiking experiments and fouling. More sensitive 3D bench-top fluorescence techniques were compared to rapid 1D in-situ detection techniques. Our results demonstrate that both instruments were able to detect minor changes in the fluorescence intensities of various peaks. In addition, intensities of chromophoric DOM (CDOM) and tryptophan-like DOM (TRP) peaks were significantly correlated for both instruments. Application of published temperature correction functions for the C3 fluorometer did improve the R-square value for CDOM substantially but had no positive effect on TRP correlations. Contaminant spiking experiments in different water sources proved that another peak, related to tyrosine-like fluorescence, is most effective for monitoring a range of contaminants, including benzene, diesel, ibuprofen, and caffeine, in water systems. Our results demonstrated that optical filters on the 1-D instrument, which utilize an excitation and emission wavelength window, gave better estimates of contaminant concentrations that single excitation and emission wavelength pairs. Overall, fluorescence spectroscopy is suitable for monitoring the presence of contaminants in water.

530 9:30 am

Driver Behavior Modeling for Curve Speed Warning (CSW) System Using Driving Simulator: Application of Vehicle-to-infrastructure (V2I) technology

Alidad Ahmadi, Transportation Engineering (M)

Curve Speed Warning (CSW) is one of the Advanced Driver Assistance Systems (ADAS) that alerts drivers as their approaching speed to a curve exceeds the safe speed required to safely negotiate a curve maneuver. Due to variation in age and humans' ability to react to different stimuli, drivers tend to maintain various reaction times while receiving an alert from a warning system. The reaction time also tend to vary over time for each individual driver due to factors such as tiredness caused from long sessions of driving.

An important characteristic of a proper warning system is that the warning should be presented in a timely manner, otherwise, the driver will lose their trust in the system. An approach to help this problem is to build a system which is able to adapt to drivers' behavior. In this study, we present the application of an Adaptive Curve Speed Warning (ACSW) system which takes into account the variation in drivers' reaction time and adapts to their behavior.

A two-level warning starting with a visual warning, for less critical situation, followed by an audio warning, for more critical situation, is developed. After negotiation of a curve, timing of each level of the warning is adjusted based on drivers' reaction on previous curves. Deviation from the regular reaction time is responded with a reward-punishment approach where improvement in reaction time is followed by a reward and deterioration of reaction time is followed by a punishment. A precaution is also considered by which the amount of punishments are always larger than the amount of rewards.

Vehicle-to-Infrastructure network enable the system to collect more accurate data regarding the situation in which the driver is driving in. This information can range from traffic related parameters such traffic load on curve to climatic parameters such as road friction, which significantly affect the road-tire adherence. It is expected that integration of drivers' behavior into the design of Advance Driver Assistance System such as Curve Speed Warning, will offer a safer driving experience for users of the road.

531 9:45am

An intragranular microfracture model for geologic sequestration of CO₂ Jonathan Matthews, Computational Science (D)

A model for simulating microfracture evolution in reservoirs used for geologic sequestration of CO₂ is presented. The model is coupled to a reactive transport simulator that models the solid mineral composition as a collection of spherical grains. The fracture propagation model utilizes the Griffith fracture criterion for intra-granular microfractures. Seed fractures are randomly assigned to grains of various mineral types in each volume cell of a computational domain used to model a targeted saline reservoir. These seed fractures are allowed to propagate according to the surface energy of each mineral and the local stress intensity at the crack tips of each fracture. Stress intensities induced by CO₂ injection are determined via a poroelastic model. For the fluid flows, we use a Darcy flux model computationally modeled using mixed finite elements. The Galerkin weighted residual finite element method is used for displacements, stresses and strains with Lagrange interpolating polynomials as basis functions. The

discrete microfracture data generated by the method is coupled to geophysical and geochemical models. For geophysical properties, we utilize Oda's permeability tensor to upscale the incremental effects of microfractures on the effective reservoir permeability. The surface areas of modeled microfractures are also utilized to increment the effective reactive surface area of minerals in a geochemical model, thereby altering the rate of dissolution and precipitation of minerals on the grain surfaces. The model is used to simulate CO_2 injection into brine saturated sandstone reservoirs with overlying shale caprock layers. We use the results of our simulations to estimate the mass of CO_2 that vertically escapes a target injection formation into more shallow layers. The fate of injected CO_2 at geologic timescales can then be estimated to determine the suitability of a proposed injection site and injection schedule.

532 10:00 am

Stream channel erosion in a rapidly urbanizing region of the US-Mexico Border: Documenting the importance of channel hardpoints with Structure-from-Motion

Kristine Taniguchi, Geography, (D)

Several watersheds cross the US-Mexico border, resulting in trans-boundary environmental problems. Excessive hillslope and stream channel erosion in Tijuana, Mexico, increases the rate of sediment deposition in the Tijuana Estuary in the United States, altering the structure and function of the ecosystem. A combination of field surveys and 3-dimensional Structure-from-Motion (SfM) techniques were used to document spatial patterns in stream channel geometry in a rapidly urbanizing watershed, Los Laureles Canyon (LLCW), in Tijuana, Mexico. Ground-based SfM was used to map channel dimensions with 10 cm vertical accuracy in three stream reaches (155-300 m long) that were highly variable and difficult to survey with differential GPS. Regional hydraulic geometry curves for LLCW had statistically larger slopes and intercepts compared to undisturbed reference channels. Cross sectional areas of channels downstream of hardpoints were up to 64 times the size of reference channels, with enlargement persisting, in some cases, up to 230 meters downstream. Percent impervious cover was not a good predictor of channel enlargement. Proximity to upstream hardpoint, lack of riparian and bank vegetation paired with highly erodible bed and bank materials may account for the instability of the highly enlarged and unstable cross sections. Channel erosion due to urbanization accounts for approximately 25-40% of the total sediment budget for the watershed, and channel erosion downstream of hardpoints accounts for ~1/3 of all channel erosion. Management needs to focus on stabilizing the stream channel downstream of hardpoints, especially in areas with urban development adjacent to the stream channel.

Session H-4

Oral Presentation: Behavioral & Social Sciences OR9 **Saturday, March 4, 2017, 9:00 am** Location: Aztlan

533 9:00 am

Influence of Residence on Alcohol Consumption in College Students Courtney Patterson, Psychology (U)

Alcohol consumption of college students is a topic that has been widely studied. The present study aims to focus on students' residencies and how that influences the amount of alcohol the students consume. Furthermore, other factors are being researched as influential on alcohol consumption such as membership to a fraternity or sorority and levels of extraversion or introversion. Data was collected through an online Qualtrics survey administered to 198 college students at San Diego State University, as well as other college campuses. It was found that students who live on to campus, on average, consume more alcoholic beverages than students who live off campus. Additionally, students who are members of Greek life (either Sorority or Fraternity) consume more drinks per week and participate in binge drinking more than students who are not members. Living situation also impacts alcohol consumption in that people who live alone drink significantly more on a typical occasion, have significantly more drinks per a week, and have significantly more drinks per a month and people who live with Friends/Roommates/Significant Others engage in significantly more binge drinking per month. Lastly, it was discovered that on average, students who rank higher in extraversion consume higher amounts of alcohol per week.

534 9:15 am

Comorbidity of Methamphetamine Dependence and Human Immunodeficiency Virus Brianna Tawa, Psychology (U)

Methamphetamine use is common among people living with human immunodeficiency virus (HIV). Studies suggest this comorbidity increases one's risk to neurological, behavioral and social impairments. Methamphetamine abuse is a world-wide issue, however the prevalence in Southern California makes this project relevant and a topic of interest. The objective of this project is to measure the cortical thickness of many regions of the brain through computational modeling and structural brain imaging methods using MRI.

Currently the study has one-hundred one participants. The participants have been screened to meet the diagnostic criteria of having a history of methamphetamine dependence, having HIV disease or neither. Participants are categorized into four groups- individuals who are neither methamphetamine dependent or HIV infected, methamphetamine dependent individuals, HIV infected individuals and both methamphetamine dependent and HIV infected persons.

Software programs such as FreeSurfer measure the cortical thickness of various brain regions of these four groups. This programs assists in quality assurance. Comparing the cortical thickness of these four groups may provide insight into methamphetamine's impact on neurological deficits.

535 9:30 am

Moderators of Correlates of Sexual Compulsivity among Men who have Sex with Men: Results from a Meta-Analysis

Benjamin Rooney, Psychology (M)

Background: Sexual compulsivity is characterized by preoccupation with sexual cognitions and urges, which may cause distress and negatively impact everyday life. However, sexual compulsivity is not currently recognized as a psychiatric disorder, citing a lack research on the construct, as well as disagreement regarding its classification. Efforts have been made to better understand sexual compulsivity by examining salient psychosocial issues (i.e., depression, anxiety, alcohol use, drug use, intimate partner violence, childhood sexual abuse, and sexual risk behavior.) among men who have sex with men (MSM), yet have yielded inconclusive results. The aims of the current study were: 1) Explore extant literature to reveal what psychosocial issues are significantly associated with sexual compulsivity among MSM; 2) Establish the mean effect size of each psychosocial issue with sexual compulsivity; and 3) To determine if this effect varied as a function of psychosocial issue, and investigate potential moderators, including age, race, publication year, HIV status, and sexual compulsivity measure utilized. Method: Ninety-six studies were included for analyses among seven psychosocial issues. Studies were collected, redundant studies eliminated, and abstracts were read to determine eligible studies. A pair of independent coders ensured accurate cataloguing of each qualified study. Results: Using mixed-effect models, results showed that across all psychosocial issues, the mean effect size of sexual compulsivity was r = .16. Type of psychosocial issue significantly moderated the strength of the effect. Given this significant between-groups effect, the mean effect was interpreted within each level of the psychosocial issue, revealing the strongest associations of sexual compulsivity with anxiety (r = .32) and depression (r = .32). Age and sexual compulsivity scale used in analysis moderated these associations; other moderators are discussed. Conclusion: This is the first known meta-analysis on sexual compulsivity among MSM. A significant mean effect size was found for all psychosocial issues examined with sexual compulsivity and varied by type of psychosocial issue. These factors have been noted as increasing HIV risk among MSM, a population disproportionately impacted by HIV. HIV treatment and prevention programs may benefit from targeting sexual

compulsivity and the comorbid factors anxiety and depression. Additionally, clinicians should be considerate of the age and race of patients during treatment, as well as psychometrics used for self-report measurement.

536 9:45 am

Correlates of Tanning Dependence amongst Sexual Minority Males

Kelsey Nogg, Psychology (M)

Background: Sexual minority males are an at-risk population for developing skin cancer. Disparities in skin cancer diagnoses among sexual minority males are likely the result of increased skin cancer risk behaviors. Indoor and outdoor tanning have been linked to increased likelihood of developing skin cancer, and sexual minority males tan at rates comparable to or greater than heterosexual females. One construct that may underlie frequent tanning is tanning dependence: compulsive tanning behaviors associated with tolerance, withdrawal, and craving of UV exposure. To date, preliminary research has shown tanning dependence to be associated with increased skin cancer risk behaviors; however, no known studies have examined tanning dependence among sexual minority males. Thus, the current study aimed to explore the correlates of tanning dependence among a sample of young, sexual minority males.

Methods: This study employed Facebook to recruit 238 sexual minority males ages 15 to 35 years (M = 24.56, SD = 5.44) living in San Diego County. Participants completed an online self-report questionnaire, which included items assessing skin cancer risk behaviors (e.g., indoor and outdoor tanning behavior, use of sunscreen). Tanning dependence was measured via the Behavioral Addiction Indoor Tanning Screener (BAITS).

Results: Elevated tanning dependence was significantly and positively associated with intention to indoor tan within the next three months, (r = .31, p < .001), frequency of indoor tanning over the past three months (r = .44, p < .001), and frequency of outdoor tanning over the past three months (r = .20, p = .002). Elevated tanning dependence was also significantly and negatively associated with frequency of sunscreen use (r = .15, p = .026).

Conclusion: The current study is the first known to explore tanning dependence among sexual minority males—a population at risk for developing skin cancer. Elevated tanning dependence was associated with several established skin cancer risk behaviors, suggesting that tanning dependence may play a role in skin cancer disparities seen among sexual minority males. Thus, future skin cancer prevention efforts aimed at this population may benefit from exploring strategies to reduce tanning dependence in order to prevent the development of skin cancer.

537 10:00 am

Rates and Correlates of Syphilis Re-infection in Men who have Sex with Men in San Francisco Jennifer Jain, Interdisciplinary Research on Substance Use (D)

Background: In 2013, the rate of reported primary and secondary syphilis in the United States was 5.3 cases per 100,000 persons, which is more than double the rate of 2.1 in 2000. This resurgence of syphilis infection has occurred primarily among men who have sex with men (MSM). Over 83% of all primary and secondary cases of syphilis in the United States are among MSM. However, relatively little is known about the rates and correlates of syphilis reinfection in this population.

Methods: From 2012-2013, 323 MSM received treatment for primary or secondary syphilis at a community-based clinic in San Francisco. Using clinical record data, we extracted demographic information, self-reported binge drinking in the past 30 days, and self-reported substance use in the past year. Our outcome was syphilis reinfection, defined primary or secondary syphilis infection reported to the San Francisco Department of Public Health following initial treatment. We evaluated correlates of reinfection using multivariable cox proportional hazards models.

Results: The mean time to syphilis reinfection was 24.8 (SD = 7.9) months such that one in five men (71/323; 22%) were re-infected over follow-up. The rate of syphilis reinfection was greater among HIV-positive men (adjusted Hazard Ratio [aHR] = 1.84; 95% CI = 1.08 – 3.12) and those who reported any ketamine use in the past year (aHR = 3.99; 95% CI = 1.64 – 9.71). Ketamine users (n = 15) were significantly more likely to report using multiple substances in the past year (i.e., methamphetamine, cocaine, amyl nitrites, ecstasy, and gamma-hydroxybutric acid [GHB]) compared to those who did not report ketamine use (n = 317).

Conclusions: Syphilis reinfection rates were high among MSM in San Francisco. Syphilis prevention efforts targeting MSM should address the unique needs of those who are HIV-positive and target substance use as a potential driver of syphilis reinfection.

Session H-5

Oral Presentation: Humanities OR4 **Saturday, March 4, 2017, 9:00 am** Location: Metztli

538 9:00 am

Did Women Have an Axial Age? Gender and Cosmic Reciprocity Leah Gregory, History (M)

Venerated phrases like the "birth of compassion" and "the age of transcendence" have been used to describe the period between 800-200 BCE, a time defined as the "Axial Age" by

German philosopher Karl Jaspers. Jaspers's Axial Age theory advocated a "universal" human history by establishing a new point of common origin characterized by the emergence of multiple religious traditions across the globe. Some scholars agree that the 1st millennium BCE corresponds to a watershed moment in human cognitive development (Eisenstadt, 2011; Bellah, 2013). Others suggest that philosophical transformations in the period were initiated by innovations in energy capture and eclipsing previous thresholds of affluence, rather than the result of human maturation (Baumard and Boyer, 2013). However, the debate surrounding the Axial Age, regardless of theoretical purview, is blatantly devoid of any discussion of women.

In the spirit of Joan Kelly's "Did Women Have a Renaissance?", this study examines textual sources---like the Buddhist Pali Canon, the Analects of Confucius, and the Hebrew Bible---for evidence of women's experience of an Axial Age, or if they even had one. The scope of selected excerpts in this paper have been narrowed to passages regarding "cosmic reciprocity," a subset of characteristics of Axial Age philosophy.

This analysis represents one component of my larger project, "Did Women Have an Axial Age?," which will establish that if there was indeed an Axial transformation, it was an unquestionably male experience, rendering its universality void, and the periodization itself fatally flawed.

539 9:15 am

Recasting Jewish Magic: Female Responses To Changes in World History Samantha Young, History (M)

And the Angels taught their mortal wives incantation, the cutting of roots, the seeing of stars, the course of the moon, as well as the deception of man, "And the people cried and their voice reached unto heaven." This passage from the Book of Enoch (2nd century BCE) illustrates the religious ideologies of women's relationship with magic, but lacks a historical investigation that would reveal scholarly understanding. The scope of scholarly inquiry has been limited both temporarily and spatially, emphasizing only trends in Biblical, ancient Mediterranean, and Medieval Jewish Magic practices. While scholarship has treated these as disparate phenomena, there lacks an attempt to synthesize such knowledge into a composite whole, an amalgamation would demonstrate the continuity within the aforementioned traditions across time and space.

A comparative analysis of Jewish Women's Magic practices found within the Hebrew Bible and contemporaneous pseudoapocryphal texts, ranging from the Levant of biblical antiquity, to ancient Rome, and to Medieval Europe, this paper explores the responses in Jewish Women's Magic to developments and influences in World History.

Such an analysis demonstrates not only changes in magic practices, but also highlights the ways in which Jewish women responded to challenges posed by an increasingly interconnected Afroeurasia, and the threats posed to ethnic identity by nascent globalization. This paper offers a gendered image of World history revealing the modes in which magic served as a vehicle of agency for Jewish women, whose gender and religion would otherwise proscribe their historical experience to a veritable damnatio memoriae.

540 9:30 am

Sacred Women in Christianity and Buddhism: A Comparison of Mary, Avalokitesvara, and Guanyin from 300-900 CE

Sarah Kemp, History (M)

The question of why Buddhism had only diffused into East Asia and not the Mediterranean World has been largely left unanswered. This paper compares Christianity's Virgin Mary with the Mahayana bodhisattva Avalokitesvara and her Chinese counterpart Guanyin to show the likeness of the Mahayana bodhisattva(s) and Mary should have allowed Buddhism to be imported and adapted in the Christian Mediterranean. While scholars have done comparisons of Mary and Guanyin in the past, much of the scholarship only parallels the two sacred women as images of mercy and their scriptural significance in their respective religions. This paper, however will take these conclusions one-step further by using these commonalities to show that Buddhism should have found fertile soil and been adapted in the Christian Mediterranean world if it had traveled on the Silk Road west of the Parthian Empire after the second century.

A textual source analysis of the Lotus Heart Sutras for understanding the significance of Avalokitesvara and Guanyin within Buddhism and biblical books, such as the Gospel of Luke and Revelations, to comprehend Mary's place within Christianity. Images of the bodhisattvas from Buddhist art sites, such as the Mogao Caves, and Mary, such as the "Our Lady of Rome" from the 5th century, will be compared to show images of veneration worship. Cultural and textual analysis of the art and sacred texts of both Christianity and Buddhism are used in this paper to better understand cross-cultural exchange and religious adaptation occurring along the Silk Road between Eurasia.

541 9:45 am

"The Story Seems to Wear the Stamp of Truth": Verisimilitude, Science Fiction, and H. Rider Haggard's *She*

Anni Perheentupa Mackey, English (M)

Sir H. Rider Haggard is considered one of the founding authors of imaginative literature, and is best known for his swashbuckling adventure novels like *King Solomon's Mines* and *She: A History of Adventure*. My presentation argues that She is not only a classic of imaginative literature, but more specifically an early example of science fiction, deliberately crafted to appeal to the scientific imagination of its 19th century reader. By dissecting the methods with which Haggard creates verisimilitude in his novel and analyzing the very intentionally crafted scientific narrative of *She*, I demonstrate the ways in which the novel most naturally falls into the genre of science fiction. I also take a look at Haggard's novel in terms of the popular science of its time to situate it within the greater cultural context of early science fiction. Ultimately, my presentation shows that by discussing Haggard's *She* as early science fiction, the novel opens itself to new interpretations and entirely new avenues of analysis, and enables us to discover new aspects of the imperialist focus that is inherent in both Haggard's work and other literature of his time.

542 10:00 am

Changing Narratives to Changing the Narrative S. L. Kay, History (M)

When George Antonius wrote his manifesto, The Arab Awakening, in 1938, he was pushing forward an agenda and ideology that was at least 100 years in the making, yet as fresh as the day's headlines. Looking back at the passage of political awakenings throughout the Middle East from just before World War I, when the subject was the talk of cafes and secret literary clubs to the recent outburst of enthusiasm in the Arab Spring of 2011, the specifics in describing the movement and its goals have changed. Different perspectives in the region started with a handful of Arab Christians in their quest for respect of their special identity in the mid-19th Century Lebanon to the disgruntled Syrian expatriates in Paris at the beginning of the 20th. By the close of WWI, the recently liberated Arabs demanded self-determination after 500 years of Ottoman rule. Their demands were chiefly ignored by Europe--the only power strong enough to grant them--thus, the movement moved from polite discourse to violence. Arabism became Arab Nationalism, which would evolve into a pan-Arab program. That outlook would dissolve into fragments as each nation would struggle with its identity in the Cold War, the surge of post-colonial empowerment and the revival if Islamism.

This paper will present the evolution of Arab political thought and the views by which it was seen by local and foreigner alike. The gentle persuasions of Antonius and Ameen Rihani would give way to the frustrated outpourings of the Wafd Party in Egypt and the Husseinis in Palestine. Too much was reliant upon how the "major powers" would reconcile the disparity between promise and policy; a weakness explained in Edward Said's controversial 1978 book, *Orientalism*.

The different generations would each face unique challenges. Arab nationalism would deal with numerous obstacles to recognition and fulfillment. Each period under consideration presents unique views on the discourse just as history adapts to changing narratives. Those narratives, in turn, provide new answers to the ageless problems of identity and political and even religious validation.

543 10:15 am

An Experiment in Gothic Writing: Considering the Donner Party as American Legend Rachel Greenberg, Creative Writing (M)

The story of the Donner party, the group of 87 pioneers who became stranded in the Sierra Nevada mountains and may have been forced to resort to cannibalism, has become a familiar part of American folklore. But with familiarity comes inurement. In my MFA manuscript, written under the guidance of Professor Katie Farris, I have treated the legend through the modes of speculative and gothic fiction to find new ways to explore its resonance in the American imagination and to experiment with our responses to it.

My novel is structured as a series of linked short stories, each of which follows a different member of the Donner party at different moments of the journey. The novel begins where the Donner journey ends, with the first group of rescue parties arriving in California. In my version, an unexplained time warp has caused 14-year-old Elitha Donner to end up in modern day Coachella. The stories work their way back to the start of the journey and along the way characters are faced with hauntings, inexplicable moving mountains, and murderous cults.

This manuscript is the result of the craft training that I have had as a graduate student at SDSU, and also of my research in the disparate fields of gothic literature and indigenous American folklore. The initial impetus for the story came about as the result of Professor Stephen Paul Martin's class in the form and theory of fiction, which helped me to make important discoveries about the architecture of both horror stories and satire writing. This resulted in the writing of the Coachella story. From there, I became interested in the ways that artists treat the story of the Donner Party; some through horror, some sentimentality, and some comedy. Gothic writers have long intermixed these techniques, and so I chose to use use the gothic as an experimental approach to the complex cultural resonance of the Donner Party. This has allowed me to use the Donner Party and its legacy to consider topics with modern relevance like the status of refugees, racist infrastructure, and the experience of trauma.

Session H-6

Oral Presentation: Behavioral & Social Sciences OR10 Saturday, March 4, 2017 9:00 am Location: Templo Mayor

544 9:00 am

Second Wave Revisited: CA Feminist Policymaking by the First Assemblywomen of Color Nassim Moallem, Women's Studies (U)

California has long been a feminist leader. However, a lack of scholarship around individual state's movements during feminist waves, particularly the second-wave of feminism, has limited

our ability to understand the factors that allow for California to have established a reputation for women's rights. My research began in order to answer what factors allowed for California in particular to be able to pass feminist legislation in the late 1960s-1970s.

The primary method of data collection was archival research conducted at USC, UC Berkeley, UC Irvine, and SDSU as well as the GLBT Historical Society in San Francisco and the California State Archives in Sacramento. Microfiche was also used to collect all available copies of Skirting the Capitol, a CA newsletter documenting CA legislation that affected women that ran from 1967-1974. During a time period where the state was led by Republican Governor Ronald Reagan and the state legislature only had three women for eighty representatives, I found several pieces of feminist legislation were introduced and passed. These bills included ones regarding abortion and reproductive healthcare for pregnant prisoners, as well as childcare for female students and sexuality education amongst other issues like sex discrimination in the workplace.

As the mainstream understanding of second-wave feminism tends to be centered around the domination of white women and their concerns, I was particularly interested in the discovery that two of three women in state legislature were women of color. My research examines the work of Yvonne Brathwaite Burke and more briefly March Fong, the first African-American and Asian-American Assemblywomen in California. Yvonne went on to become a Congressional Representative while March became California's first female Secretary of State. Two unknown, 'hidden figures', in California history, I document their political contributions towards expanding women's rights in California during the second-wave. I investigate why their contributions have remained largely invisible, and further analyze how we can understand their policy work through a lens of reproductive justice.

545 9:15 am

Got Milk?: Investigating the Social Stigma Surrounding Breastfeeding Laura Horton, Communication (U)

Mothers all over the country are being berated for doing what comes naturally: nursing their children. Over the past few decades, women's right to publicly breastfeed has become controversial in American politics. The Second Wave of feminism ushered in a more public lifestyle for the average American woman, and, given the economic downturn in 2008, an increase of mothers have begun to work in the public sector in order to support the family. This has led to the need for women to perform their roles as mothers in the public world as well. Despite the biological need for both mother and child, many Americans are adamantly opposed to public breastfeeding. Many see it as obscene, repulsive, and disgusting resulting in more women choosing to end breastfeeding early. And yet, California Civil Code states, "a mother may breastfeed her child in any location, public or private [...] where the mother and the child are otherwise authorized to be present" (Cal. Civil Code § 43.3 et seq). In order to demonstrate that there is still a prevalent stigma surrounding breastfeeding, our study

investigates perceptions concerning public breastfeeding at SDSU and compares our findings to national trends. A short workshop featuring three panelists involved with lactation advocacy around San Diego was held in the Women's Resource Center. In order to gauge the knowledge and personal opinions of attendees, a pre- and post-workshop survey was distributed. Results showed that the majority of participants (~83.3%) had witnessed a mother nursing her child but only 50% of attendees felt that they would be somewhat or extremely likely to intervene if they saw a mother being harassed for breastfeeding. Results also demonstrate that many participants were not aware of the legal protections afforded nursing mothers and their babies both in public and at the workplace. This revealing research project represents a catalyst for more in-depth studies of public opinion regarding breastfeeding as well as greater advocacy and education on topics surrounding postpartum reproductive rights.

546 9:30 am

Analysis of Traumatic Experiences over Time Using the Massachusetts Youth Screening Instrument, Version 2 (MAYSI-2)

Parker Hansen, Master of Social Work(M)

This study examined the interrelationships among juvenile trauma experiences, mental health disorders, age, ethnicity, gender and recidivism using a sample of adolescents detained in a juvenile detention facility over a seven-year period. The development of this research was based on a fundamental axiom that trauma produced a critical function in the psychological emanation and eventuation of sociobehavioral factors associated with adjudicated youth and recidivism. Recidivism was defined as any adolescent who was admitted to the juvenile detention facility two or more times. Adolescents admitted multiple times to detention facilities were believed to have experienced high levels of trauma and may be living with mental health disorders. As a result, the Massachusetts Youth Screening Instrument (MAYSI-2) screened each adolescent for: Alcohol/Drug Use, Anger-Irritability, Depressed-Anxious, Somatic Complaints, Suicidal Ideation, Thought Disturbance, and Traumatic Experiences. Through the use of secondary data, comprehensive analysis was conducted that measured traumatic experiences, mental health scores, and recidivism in a sample of male and female adolescents between the ages of 12 and 17. Preliminary findings underscored the need to continue to build upon the early identification and treatment of mental illness. Results are pending and the discussion of implications for social work practice and interventions will be presented at a later point in time.

547 9:45 am

Does caregiver social support affect children's oral health? A systematic literature review Erin Dougherty, Public Health/Health Behavioral Sciences (D)

Purpose: Examine the existing literature on caregiver social support (SS) and children's oral health (OH) status (dental caries) and behavior (home OH care and dental utilization).

SS is protective for other health behaviors, and warrants further investigation in OH.

Methods: A peer-reviewed literature search was conducted through Medline/PubMed, Google Scholar and reference review. Search terms used included: 'mother', 'maternal', 'caregiver', 'social support', 'oral health', 'dental health', 'ECC', and 'caries'. Initially, 119 articles were identified, 54 remained after title/ abstract review, and 18 full papers were read. Upon closer review, nine papers discussed SS, but did not explicitly measure SS associated with child OH. The two outcomes of interest across studies were OH status and behavior and were not mutually exclusive. Nine papers (2007-2016) were included in the final review.

Results: Overall, seven of the nine studies included both self-report and clinical data. About half (5 of 9) employed a cross-sectional study design. One study provided SS as the intervention and four studies focused only on OH behavior.

SS measurement varied. Four studies focused only on instrumental SS, measured by single-item questions. Three studies used validated SS scales: The Multidimensional Scale of Perceived Social Support (MSPSS), the Family Questionnaire, and the Social Support Rating Scale (SSRS).

Three of four behavioral studies reported significant positive associations between SS and OH behaviors. Six studies focused on a clinical outcome: dental caries as measured by the decayed, missing, filled tooth index (dmft). Two of those six studies found statistical significance between higher SS levels and lower dental caries experience (one cross-sectional, one longitudinal).

Conclusion: Preliminary findings from the nine studies are inconclusive, but point in a promising direction. Five studies reported significant associations, but additional research is needed to better understand the relationships between caregiver SS and child OH. SS was measured similarly across studies, focusing on one dimension: instrumental support. Future research should explore all four dimensions of SS to better understand the relationship between caregiver SS and child OH.

Session I-1

Oral Presentation: Biological & Agricultural Sciences OR6 **Saturday, March 4, 2017, 9:00 am** Location: Pride Suite

548 11:00 am

Global and Local Studies of crAssphage: a Highly Abundant Phage Found Around the Globe Holly Norman, Microbiology- Public Health and Clinical Laboratory Science (U)

Recently there have been a plethora of studies, which have indicated that many diseases, such as mental disease, obesity, and others may be affected by fluctuations in the human gut

microbiome. However, this connection between microbes and human health has yet to be fully understood, due to most human microbiome studies focusing on bacteria, while overlooking the role of phages in the microbiome.

From in silico analyses of human metagenomic data sets, we discovered a phage known as crAssphage, that is present in roughly half of the human population across the globe. Although crAssphage is highly abundant, its role in humans is still unknown. To get a better understanding of crAssphage, we are investigating the distribution and variance of crAssphage on a spatial and temporal scale. Since crAssphage was found in human-associated metagenomic data sets, we designed PCR assays to screen influent samples from wastewater treatment plants, which were collected on a bimonthly basis throughout Southern California. CrAssphage's DNA was amplified through PCR, the amplicons were sequenced and a bioinformatics analysis of the data was conducted. The data shows how crAssphage has changed over time in one geographic area. Our collaborators around the globe have also amplified and sequenced the same regions of this phage using influent from wastewater treatment facilities across the globe. The data has shown clustering of crAssphage based on the country from which the sample was collected, indicating that this virus has evolved throughout different geographic locations.

549 11:15 am

Forever young: Cranial growth in the gray whale (*Eschrichtius robustus*) based on ontogeny and phylogeny Meghan Smallcomb, Evolutionary Biology (M)

Distinctive patterns of heterochronic ontogenetic change (the change in the timing or rate of developmental events and works by disturbing the growth, development, and/ or maturation of an organism's ancestral ontogenetic trajectory), namely paedomorphosis (a descendant that resembles the ancestor at a younger stage of development) and peramorphosis (a descendant that resembles a point of continued development), can have implications on evolution. It has been suggested that paedomorphosis and peramorphosis might cause limited or released developmental constraints, leading to low or high taxonomic diversity, respectively. Modern baleen whales (mysticetes) have four distinct lineages (Balaenopteridae, Neobalaenidae, Balaenidae, and Eschrichtiidae) that display both patterns and have high and low taxonomic diversity. One major issue regarding mysticete lineages is whether the Eschrichtiidae (gray whales) are sister to Balaenopteridae (i.e. humpback, fin, and minke whales) or are nested within Balaenopteridae. A previous study was done using geometric morphometric (landmark) analyses on two of the three lineages (Neobalaenidae (pygmy right whales) and Balaenopteridae) with neobalaenids showing paedomorphosis and *balaenopterids* showing peramorphosis. Here, the lineage (Eschrichtiidae) is analyzed and considered in a heterochronic context. Since Eschrichtiidae has a single extant species like Neobalaenidae I hypothesized it would show the same heterochronic pattern, paedomorphism. A

landmark analysis (33 landmarks) on an ontogenetic series of 18 gray whale skulls was conducted. The results show that, during ontogeny, skull morphology (excluding size) changes very little and retains an overall juvenile morphology from neonate to adult, indicating paedomorphosis. Geometric morphometric analysis shows that different areas of the skull are growing at different rates. However, when compared to the previously studied lineages, the neonate and adult of *Eschrichtius robustus* plot together with neobalaenids, while *balaenopterid neonates* plot separately from the adult skulls. Resulting heterochronic patterns agree with the diversity of modern mysticete lineages, helping to determine the evolution of skull growth in *mysticetes* and the placement of *Eschrichtiidae* as sister to *Balaenopteridae*.

550 11:30 am

Phylogenetic Inference Of North American Water Mites in The Subgenus *Micruracarus* (Genus *Arrenurus*, Family *Arrenuridae*) Utilizing Morphological and Molecular Characters Rachel Shoop, Evolutionary Biology (M)

Mites comprise one of the most diverse taxa on the planet with an estimated 48,000 to 55,000 named species and between 0.5 to 1 million total species. Water mites are very ecologically successful, inhabiting almost every aquatic habitat on every continent except Antarctica. Despite their diversity, water mites are understudied and many groupings below the genus level are likely not monophyletic, although morphological descriptions of higher taxa are generally accepted. This research aims to resolve the phylogenetic relationships of water mites within the subgenus Micruracarus. To do this, I compiled morphological trait data along with mitochondrial and nuclear DNA sequence data for 15 North American Micruracarus species, and several outgroup species. The morphological data included distinguishing traits, such as body shape and lengths of plates on the underside of the body. The genetic data included regions from a mitochondrial gene (cytochrome c oxidase 1) and nuclear ultraconserved elements (UCEs) amounting to several hundred loci, which were used to reconstruct a phylogeny for Micruracarus using likelihood-based and Bayesian methods. The results of this research are expected to influence a taxonomic revision of Micruracarus and the other three subgenera within the genus Arrenurus. The comprehensive analysis of water mite morphology and scope of genomic sequencing implemented here may be applied to other species of mites.

551 11:45 am

Shark biology regulates taxonomic composition while environment mediates the gene potential across microbiomes of three species Michael Doane, Biology (D)

Multicellular organisms are host to a community of microorganisms that are important to normal host physiological functioning, termed the microbiome; and sharks have been found to host a specific skin microbiome that varies from their surrounding marine environment. The skin is the largest organ and subjected to attacks by opportunistic and pathogenic microbial invasion. Sharks, (and other Chondrichthyan fishes) having diverged from other vertebrates ~ 500 mya, have unique skin features that vary from other vertebrate hosts. Characterizing the presence and distribution of microbiome members at the skin interface can improve prediction for health concerns in sharks, however it remains unknown if sharks of different species exhibit similar microbiome community patterns. To address this, we investigated the skin surface microbiome from three shark species, including common thresher (Alopias vulpinus), leopard (Triakis semifasciata) and whale shark (Rhincodon typus). We hypothesized the skin microbiome would be influenced by a combination of host and environmental factors. The skin microbiome was taken from the base of the forward dorsal fin from all sampled shark individuals (n = 18 sharks) using the 'supersucker' method. Metagenomic (taxonomic and potential gene) profiles were generated using next generation sequencing. We found that the taxonomic and gene potential composition of the host microbiomes varied among shark species. Beta-diversity of within species taxonomic composition did not vary across the three shark species, however gene potential composition beta-diversity was different. We additionally analyzed several factors classified as host (maturity, scale structure, swimming speed, and species divergence time) and environmental (latitude and longitude) that could influence microbiome composition. The results of distance based-linear modelling showed that taxonomic composition of the microbiome best correlated with a combination of swimming, scale structure, and time of divergence, which indicates shark species is important for determining taxonomic composition of the shark skin microbiome. Gene composition however best correlated with divergence and longitude, indicating that the environment and species are important to microbiome composition in sharks. Our results indicate the complex interplay of both environment and host in influencing the host microbiome differently across biological axes of taxa and gene composition.

552 12:00 pm

Lost in transition: developmental patterns of tooth formation and loss in fetal baleen whales and implications for mysticete evolution

Agnese Lanzetti, Evolutionary Biology (D)

The origin of origin of bulk filter feeding utilizing hair-like structures (baleen) in mysticetes (baleen whales) occurred 28-24 million years ago and represents a major macroevolutionary transition in whale morphology (teeth to baleen) and ecology (raptorial to filter feeding). Fossil evidence shows that two distinct lineages of *Oligocene mysticetes* (*Aetiocetidae* and *Eomysticetidae*) preserve bony structures compatible with the occurrence of baleen. *Aetiocetid* fossils preserve an adult dentition, while eomysticete fossils preserve alveolar grooves and alveoli that may indicate the presence of a reduced adult dentition in the anterior portion of the mouth. The presence

of baleen or similar structures in Aetiocetidae has been challenged by some authors, given that these specimens still retain a full dentition that may interfere with baleen plates during feeding. We collected new evidence to test the hypothesis of co-occurrence of teeth and baleen in the fossils by showing their simultaneous presence in fetal specimens. The prenatal developmental sequence of modern mysticetes also records the dramatic cranial changes that are correlated with mysticete evolution. We employed computed tomography (CT) scanning enhanced with a reversible iodine staining protocol to increase contrast in the CT data for nine fetal specimens of humpback, blue, minke and sei whales. The presence of tooth buds was observed in all specimens, with the largest individuals having the most complete dentitions (15-25 teeth per side in both upper and lower jaws). One large specimen shows the presence of tooth buds as well as denser material, which we hypothesize to be baleen-forming tissue. Based on these new anatomical data, we propose a hypothesis that reconstructs the dramatic ontogenetic shifts in mysticete skull development that include the resorption of fetal dentition and the origin and growth of baleen. Comparison with developmental data in odontocetes (toothed whales) suggests that acceleration in cranial growth and tooth formation during ontogeny in mysticetes could have allowed for the evolution of baleen, by permitting the teeth to be reabsorbed and the baleen plates to grow without dramatically increasing gestation time. This evolutionary transformation from teeth to baleen could have driven the gradual ecological shift from raptorial to bulk filter feeding.

Session I-2

Oral Presentation: Behavioral & Social Sciences OR11 **Saturday, March 4, 2017, 11:00 am** Location: Park Boulevard

553 11:00 am

Pediatric Cannabis and the Barriers to Medicinal Use for Intractable Epilepsy Tiyana Dorsey, Anthropology (U)

Cannabis has long been known, anecdotally, to ease seizures. Now that cannabis is legal in California, many assume that access will be easy for all. Not true for parents who seek the herb for children with intractable or pharmaceutically untreatable epilepsy. Cannabis's federal illegality has stymied formal research into its antiepileptic efficacy- meaning that doctors cannot prescribe it. In light of this, how do parents interested in the drug gain expertise in getting, preparing, and administering it for their children? What are the barriers parents experience?

To answer these questions, we interviewed 25 southern California parents who were using, have used, or sought to use cannabis for their children with intractable epilepsy. The research consisted of 25 interviews conducted face-to-face (n=17), or via video/telephone (n=8). Interviews lasted from 32 to 111 minutes each, with the average interview continuing for 66 minutes. Each interviewee also completed a brief demographic survey, to aid us in characterizing the sample.

The qualitative data highlighted barriers rooted in the fact that the herb is illegal federally. The medicine remains difficult to obtain, as it cannot be distributed through regular channels, such as United States Postal Services, forcing parents to work hard to obtain it. The lack of clinical research on the herb makes it difficult for even willing doctors to assist parents in determining the correct dosing and administration method for their children. Further, insurance cannot cover it, which creates a great economic barrier. Lastly, despite legality from medical marijuana cards, the herb's federally illegal status gives potential grounds for Child Protective Services to take a family's child, which remains a very real fear for each of these families.

Beyond revealing barriers, our findings exemplified the resiliency and determination of these parents to do what it takes to help their children. From developing support groups to facilitating workshops, parents have made the most of the little legality the herb is given. Rescheduling cannabis would permit research that could improve accessibility for parents, allow insurance to assist with medical costs, and protect families from the unnecessary invasion of CPS into their homes.

554 11:15 am

The Effects of Prenatal Alcohol and Cannabinoid Exposure on Activity Level in a Rat Model Jena Gewarges, Psychology (U)

The combined use of alcohol and cannabis during pregnancy is becoming increasingly more prevalent, especially with the increasing availability and potency of cannabis products. Both alcohol and tetrahydrocannabinol (THC), the primary psychoactive chemical in cannabis, cross the placental barrier and can have direct effects on the developing fetus. It is well established that prenatal alcohol exposure can lead to fetal alcohol spectrum disorders; however, the consequences of prenatal exposure to the combination of alcohol and cannabis are not well understood. The current study used a preclinical model to study the effects of late gestational exposure to alcohol, a cannabinoid receptor agonist (CP-55,940 [CP], which mimics THC), or a combination of both drugs on behavioral development. Sprague-Dawley rat pups were orally intubated with a milk diet containing alcohol (5.25 g/kg/ day) or sham intubation, and injected with CP (0.4 mg/kg/day, i.p.) or vehicle from postnatal days (PD) 4-9, a period of brain development that is similar to the third trimester in humans. Thus, this study used a 2 (alcohol, sham-intubated) by 2 (CP, vehicle) by 2 (female, male) between-subjects design. From PD 18-21, activity levels were observed in an open field to measure locomotor activity, exploration, and emotionality levels in adolescent rats. Exposure to either alcohol or CP alone increased overall locomotor activity levels, and the combination of these drugs showed an additive effect. Similarly, alcohol or

CP exposure increased the time spent and number of entries into the center of the chamber, which may indicate changes in emotionality; combined exposure increased these behaviors even more than either drug by itself. These results suggest that individuals exposed to alcohol or cannabis during gestation may show hyperactivity later in life, increasing the likelihood of difficulty in school or work performance, and the effects of combined exposure are additive, producing more severe behavioral changes than exposure to either drug by itself. These results suggest that pregnant women who consume both ethanol and cannabis during pregnancy are placing their fetus at increased risk for behavioral problems later in life.

555 11:30 am

Risky Business: Evaluating the Causes and Conservation Implications of Bidirectional Interactions between Humans and Moor Macaques (*Macaca maura*) in South Sulawesi, Indonesia Kristen Morrow, Anthropology (M)

Patterns of human-wildlife interaction, which often involve both human and nonhuman animals actively approaching, directing attention toward, and potentially making contact with one another, have been well studied. However, research on why humans and nonhuman animals choose to interact is limited. For this project I examined (1) how life history and social network factors shape why nonhuman primates (primates, hereafter) interact with humans; (2) how primates' social networks are impacted by interacting with humans; and (3) how and why humans choose to interact with moor macaques (Macaca maura) in Bantimurung-Bulusaraung National Park, South Sulawesi, Indonesia. Drawing from ethnoprimatology and human-animal studies, I used ethological and ethnographic methods to examine human-macaque interaction along a provincial road intersecting the national park. Preliminary analyses show that subadult males are the most risk-prone age-sex class, spending 28.69% of their time in proximity to humans. Adult and juvenile males also spending a large portion of their time in "risky" areas (20.09% and 18.16%, respectively). Conversely, adult and juvenile females demonstrate risk-averse behavior by minimizing their proximity to humans (10.83% and 13.25% of time, respectively). While these data suggest that life history explains why primates interact with humans, individual variation in these patterns suggests that social network factors simultaneously influence human-macaque interaction. Ethnographic data suggest that people act out of empathy by feeding monkeys they perceive to be hungry. However, many people purchase food specifically to provision the macaques and often stop to observe and/or photograph them, suggesting that people are also motivated to engage in nature-oriented recreation. Individuals that influence management of these macaques-researchers and national park staff-appeal to normative Western ideals of "nature", expressing a desire to maintain the natural behavior of the monkeys and separate humans from macaques. However, park staff members also emphasize ideas-including the desire to scare monkeys off

the road —which conflict with desires to maintain the 'natural' behavior of the macaques. By juxtaposing ethological data and ethnographic data I hope to improve our understanding of how humans and primates both actively shape the human-primate interface, and to offer guidance for conservation management of *Macaca maura*.

556 11:45 am

"Helping people...having them leave better than when they came in, even though I am totally ripping out their pubic hair:" Findings from the Sexual Health and Esthetician Study

Emily Greenstadt, Public Health (M)

Prior research has established beauty shops and barbershops as effective community venues for HIV/AIDS- and other public health-related interventions, due to the trusting and recurring relationship between service providers and clients. The relationship between estheticians (pubic hair removal specialists) and their clients may be similarly trustful, if not more intimate, due to the revelatory nature of pubic hair removal, therefore potentially establishing a novel platform for sexual health-related interventions. The purpose of this research was to explore the context around estheticians, their work, and their clients.

Data came from semi-structured, in-person interviews with 28 estheticians. Five interviews were conducted in each of 5 urban San Diego neighborhoods, for a total of 25 interviews. Three of the interviews involved 2 interviewees. Interview data were analyzed qualitatively, using grounded theory methodology from a social constructivist perspective. Grounded theory is an iterative, rigorous process for qualitative data analysis in which pertinent, recurring themes are harvested from the data through a process called coding. We created a codebook, operationally defining each of the codes, as determined by preliminary examination of the data. This codebook will be used to analyze all 25 interviews.

This study is currently in the data analysis (coding) phase. At this preliminary stage, prominent codes include: depth of esthetician/client relationship (e.g., clients' willingness to be open about personal experiences), esthetician/client relatability (e.g., shared experiences such as divorce or pregnancy), mechanics of the waxing process (e.g., sanitation practices, preparing the client for waxing), sexuality/sexual health (e.g., disclosures about sexual behavior, discussions regarding birth control), and esthetician's perceived role (e.g., viewing herself as a listener or counselor).

Based on preliminary results, there appears to be a uniquely intimate and trusting relationship between estheticians and clients, in which candid conversations pertaining to sexuality and sexual health frequently occur. Further data analysis will reveal deeper insight into this relationship, ideally allowing for an identification of its potential as a platform for delivery of sexual health interventions.

557 12:00 pm

Compensatory activation of the cognitive control network in heavy episodic drinkers: an fMRI study Sean M. Molnar, Psychology (M)

Cognitive control (CC) is a key component of executive functions and is engaged by conflicting stimuli in the service of modifying behavior to achieve self determined goals. It is subserved in part by the dorsal anterior cingulate cortex (dACC) and lateral prefrontal cortex (PFC). Acute alcohol intoxication dampens activity in these prefrontal areas resulting in inefficient executive functioning, compromised judgment and increased impulsiveness and may contribute to increased alcohol intake. This study uses functional magnetic resonance imaging (fMRI) to examine brain function during CC in individuals who repeatedly partake in heavy episodic drinking (HED).

In this ongoing study, healthy young adults are recruited and grouped according to consistent heavy (HED) or light (LED) drinking habits over the past six months. HED, also termed "binge" drinking is defined as consuming 6+ drinks for men or 5+ for women over a two hour period on 5+ occasions in the last six months. Participants report no history of neuropsychiatric problems, little to no tobacco use, and test negative for medications and illicit substances. Response conflict is elicited with a modified four color Stroop task; participants respond to font color under congruous (red-red) or incongruous (green-red) and control conditions. Brain images are collected with a 3 Tesla whole-body GE scanner and the fMRI data are analyzed with SPM 12.

Preliminary results indicate that reaction times are slower for HED participants with no group differences in accuracy. Neuroimaging results detail stronger activation in the dACC and PFC in HED compared to controls when responding to incongruous trials. Taken together, these findings suggest that HED individuals recruit more cognitive resources to compensate for increased demands of response conflict. In sum, individuals who engage in repeated HED exhibit altered cortical activation in key executive function regions and these effects perdure even in the absence of acute alcohol use. These abnormalities in cognitive control engagement can lead to difficulties regulating self-control and may result in impaired ability to temper alcohol use.

Session I-3

Oral Presentation: Engineering & Computer Sciences OR5 **Saturday, March 4, 2017, 11:00 am** Location: Tehuanco

558 11:00 am

Investigations on Dual Slant Polarized Cavity Backed Massive MIMO Antenna Panel with Beamforming

Mohana Vamshi Komandla, Electrical Engineering (M)

A cavity backed dual polarized massive multiple input multiple output (MIMO) antenna panel is realized with printed dipoles as radiating elements for 5G applications with frequency band from 4.9 GHz - 6 GHz. The two dipoles are placed at an angle of 45 deg and 135 deg giving slant polarization which are printed on either side of the 30mil Rogers 5880 substrate. A 4x4 sub-array of the similar cross dipoles is designed, fabricated and experimentally verified to have good impedance matching, port isolation, envelope correlation coefficient (ECC) and radiation characteristics suitable for MIMO application. The dimension of the complete 4x4 cavity backed sub-array structure is 2.8 λ X 2.8 λ X 0.6 λ , where λ is free space wavelength at 6 GHz. The measured ECC of around less than 0.1 is obtained which is well accepted for MIMO applications. Beamforming capability in digital domain is also verified for 4x4 sub-array, 8x8 and 16x16 panel array employing 4x4 sub-arrays. Measured 3D radiation pattern data is used for this beamforming study, using the Keysight SystemVue simulation tool. The 4x4 sub-array provided beam scan of +/- 45 deg and the 16x16 panel array provided +/-50 deg beam scan and low side lobe levels (13dB-18dB). Such an array can be generalized for multiple simultaneous beams which can be used for base station applications.

559 11:15 am

Investigations of Wideband Circular Polarized High Gain Microstrip Patch Array Antenna at Ku-band on Curved Surfaces

Roshin Rose George, Electrical Engineering (M)

Abstract—A wideband right hand circularly polarized (RHCP) high gain 8×8 microstrip patch array antenna operating at Ku-band on curved surface of different diameters is investigated. The planar surface 8×8 microstrip patch array parameters are compared to the curved surface 8×8 microstrip patch array parameters. The degradation of 3dB axial ratio, gain, and radiation pattern is observed from the comparison. Matching performance is almost unaltered due to the curvature.

560 11:30 am

Electrical Characterization of Low-Profile Copper Foil for Reduced Surface Roughness Loss Qianfei Su, Electrical Engineering (M)

Signal attenuation in transmission lines is a major issue for reliable transmission in high frequency range. Knowledge of the electrical parameters of printed circuit board (PCB), including dielectric constant and loss tangent, is critical. Moreover, surface roughness has a great effect on loss in high frequency. This research demonstrates an effective and time-saving simulation fitting method for electrical material characterization. Cavity resonator is chosen as the circuit for characterization. A methodology is presented to measure surface roughness from cross sections, and compared with values extracted from resonator measurements. Several materials and copper foils treatments, including low-profile, are analyzed. The major contributions of this research can be summarized as follows. Even though it is well known that the surface roughness RMS value is a critical electrical parameter, there has been no specific method for calculating it from the cross section picture. In this research, we present clearly how to calculate the RMS value of roughness from the geometry. Also, we correlate the geometrically extracted surface roughness value with its high-frequency characterization. Therefore, we intend to close a critical gap between geometrical models and electrical performance in surface-roughness loss characterization.

561 11:45 am

A Triple Mode Waveguide Corrugated Horn Antenna Using 3D Printing Technology Alejandro Castro, Electrical Engineer (M)

A triple-mode circular waveguide horn antenna with corrugated chokes manufactured using 3D printing technology is presented. The three modes are TE11, TM01, and TE21 which are is generated in a single structure. The 3D printed antenna used PC-ABS material coated with conductive silver ink. The antenna achieved a common simulated and measured matching bandwidth of 7.40GHz to 7.89GHz for all the three modes. The antenna was also tested for radiation pattern quality.
Session I-4

Oral Presentation: Behavioral & Social Sciences OR12 **Saturday, March 4, 2017, 11:00 am** Location: Aztlan

562 11:00 am

Implicit Associations about Hillary Clinton and Donald Trump: Who is more American, Competent, and Warm?

Tawny Whaley, Psychology/Philosophy (U)

The 2016 presidential election provided an opportunity to examine gender-related implicit associations with candidates Hillary Clinton and Donald Trump. Prior research suggests men are seen as more prototypical of national identities than women. Research based on the stereotype content model documents that men are seen as more competent than women, whereas women are seen as warmer than men. Present research examined the extent to which Clinton and Trump were differentiated in terms of their perceived Americanness, competence, and warmth. Although multiple factors likely contribute to implicit knowledge about these candidates, we expected that they would reflect gender stereotypes. Participants were 184 undergraduates (76 men and 108 women). Participants were ethnically diverse and politically slightly liberal. Participants completed three Implicit Association Tests (IATs) assessing the perceived Americanness, competence, and warmth of Clinton and Trump. For each IAT, they categorized, as quickly as possible, pictures of the candidates along with American vs. foreign symbols, competent vs. incompetent adjectives, or warm vs. cold adjectives. Comparisons of response latencies for different pairings allowed us to infer how the candidates were differentiated on each dimension. Participants also completed explicit measures paralleling the IATs, items assessing their political knowledge, and socio-demographic questions. Overall, candidates were not reliably differentiated in terms of their implicit Americanness. Clinton was implicitly perceived more competent and warmer than Trump. Participant's gender was a reliable source of variation on each IAT. Women displayed a reliable effect favoring Clinton over Trump on all dimensions, with a smaller effect for perceived Americanness. In contrast, men did not reliably differentiate the candidates on any dimension. In addition, moderate correlations among perceived Americanness, competence, and warmth suggested that the IATs were tapping distinct, yet related, facets of these candidates. Even when perceived as more competent and warm than Trump, Clinton seemed to face difficulty in perception of her Americanness. That men and women displayed distinct patterns of implicit associations highlights the role of gendered dynamics in this context. Implicit associations about candidates cannot be reduced to gender stereotypes or ingroup favoritism. Concurrently, these forces, along with more idiosyncratic knowledge, contribute to implicit associations about political candidates.

563 11:15 am

Influence of Emotional State on Reading Emotions Natalia Witkowska, Psychology (U)

Micro expressions inform the observers of one's internal emotional state and intentions. This knowledge is frequently used in many professions on a daily basis. However, little is known how the observer's emotional state affects the perception of micro expressions. The present study investigated the influence of happiness and fear on emotion recognition by priming the subjects with happiness - or fear - evoking videos and music, and measuring the perception using a modified METT (Micro Expression Training Tool). There was no difference in the overall perception of all universal emotion in either condition [happiness [t(25) = -1.596, p =0.123] or fear [t(27) = 0.834, p = 0.412)], as compared to the perception of people in a neutral emotional state. However, the results showed that participants primed with happiness were less likely to recognize happiness [t(25) = 3.11, p = 0.004], but more likely to recognize surprise [t(25) = -3.95, p = 0.001], whereas participants primed with fear were less able to perceive disgust [t(27) = 3.25, p =0.003] and happiness [t(27) = 4.17, p < 0.001], but more likely to recognize surprise [t(27) = -5.28, p < 0.001]. Therefore, our study suggests that one's emotional state is an important factor in emotion perception accuracy.

564 11:30 am

Let's talk about secs: Gender differences in distracted driving Hedaya Rizeq, Kinesiology (M)

The purpose of this study was to investigate whether there are gender differences in driving ability with distraction. Data collection is still underway. So far, ten healthy young adults (6 females: 22.5 ± 2.4 years and 4 males: 21.8 ± 1.5 years) have participated in this study. Participants perform a customized driving simulation on an instrumented driving simulator. The simulation involves lane keeping on a 2-lane road with a lead vehicle braking and accelerating at guasi-random intervals. All subjects are tested under two experimental conditions: 1) lane keeping with no distractions, and 2) lane keeping while performing a mental mathematical calculation. Both conditions are performed at three levels of difficulties: 60, 75 and 90 mph, in random order. Reaction times to braking and acceleration cues are recorded during all trials. Lane keeping accuracy and steering deviation are quantified from the steering wheel data. Our findings indicate that all subjects, irrespective of gender, exhibit slower braking and acceleration reaction times while distracted. On average, males are more accurate in lane keeping and drive smoothly when compared with females. Furthermore, irrespective of gender, distracted driving interacts with reaction time and steering control at higher driving speeds. Our findings have practical implications for driving assessment of newer teenage and young adult drivers.

565 11:45 am

Communicating Pain: How Gender Identity Influences Self-Disclosure and Pain Tolerance During the Cold Pressor Task

Chelsea Chapman, Communication (M)

Many studies have noted the differences between males and females with regard to pain tolerance. However, there are fewer studies that analyze how gender identity (i.e., masculinity and femininity) rather than biological sex influence pain tolerance. There are fewer studies still on how pain tolerance and gender identity influence the disclosure and communication surrounding pain. We hypothesize that gender identity, despite biological sex, will relate positively to pain tolerance and negatively to self-disclosure. Our study utilizes self-determination as a theoretical framework to explain why individuals high in masculinity would be more motivated to conceal their pain from others. The present study is a hybrid of communication and biology, which will feature a questionnaire and cold pressor lab component to assess university students' pain tolerance, gender identity, self-disclosure, toughness, and verbal aggression. Our study uses a cold pressor task (CPT) to assess true pain tolerance in participants because there is marked disparity between reported pain and experimentally tested pain tolerance. An estimated 300 university students will be asked to complete a 102-item questionnaire and CPT to assess these variables. If this study's hypotheses are supported, the results would identify traits and populations that are at high risk for concealing their pain rather than communicating their pain to doctors. Doctors and health organizations armed with this knowledge would be able to implement formal questionnaires or informal procedures for identifying these high-risk patients (e.g., gender identity surveys). Doctors armed with this knowledge can then spend more time on eliciting information about pain from these patients in order to improve diagnosis and pain relief.

566 12:00 pm

Latina Mothers Speak: A Comparative Analysis of Motherhood Experiences in the Tijuana/ San Diego Border/lands

Sarai Godoy, Chicana and Chicano Studies (M)

The bases for this study are the increased attention on gentle parenting and the importance of gendered work, such as breastfeeding, and m(other) work. This study will analyze the main challenges and dilemmas that first-time mothers face in their daily activities. It will also identify and examine the tools developed in order for them to parent their children and be socially validated. This study is anchored in Chicana Feminist Epistemology (CFE), which questions traditional colonial methods of motherhood. This work applies a qualitative approach that focuses on intimate oral histories shared by eight contrasting first-time mothers on each side of the Tijuana/ San Diego border who gave birth within the last ten years. This research will contribute to a growing body of knowledge on Latina motherhood as well as to a healing culture that is welcoming of Latina mothers sharing their experiences.



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