March 1 and
March 2, 2019

SRS
STUDENT RESEARCH SYMPOSIUM

A Showcase of
Student Discovery
and Innovation

Twelfth Annual Student Research Symposium

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

San Diego State University
Leadership Starts Here

AZTEC PARENTS
SAN DIEGO STATE UNIVERSITY

The PRESIDENT'S LEADERSHIP fund

SAN DIEGO STATE UNIVERSITY
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ΦΚΦ
CHAPTER OF EXCELLENCE

ΠΣΑ

ΦΒΚ

SRS

Twelfth Annual Student Research Symposium

March 1 and March 2, 2019

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

SAN DIEGO STATE UNIVERSITY

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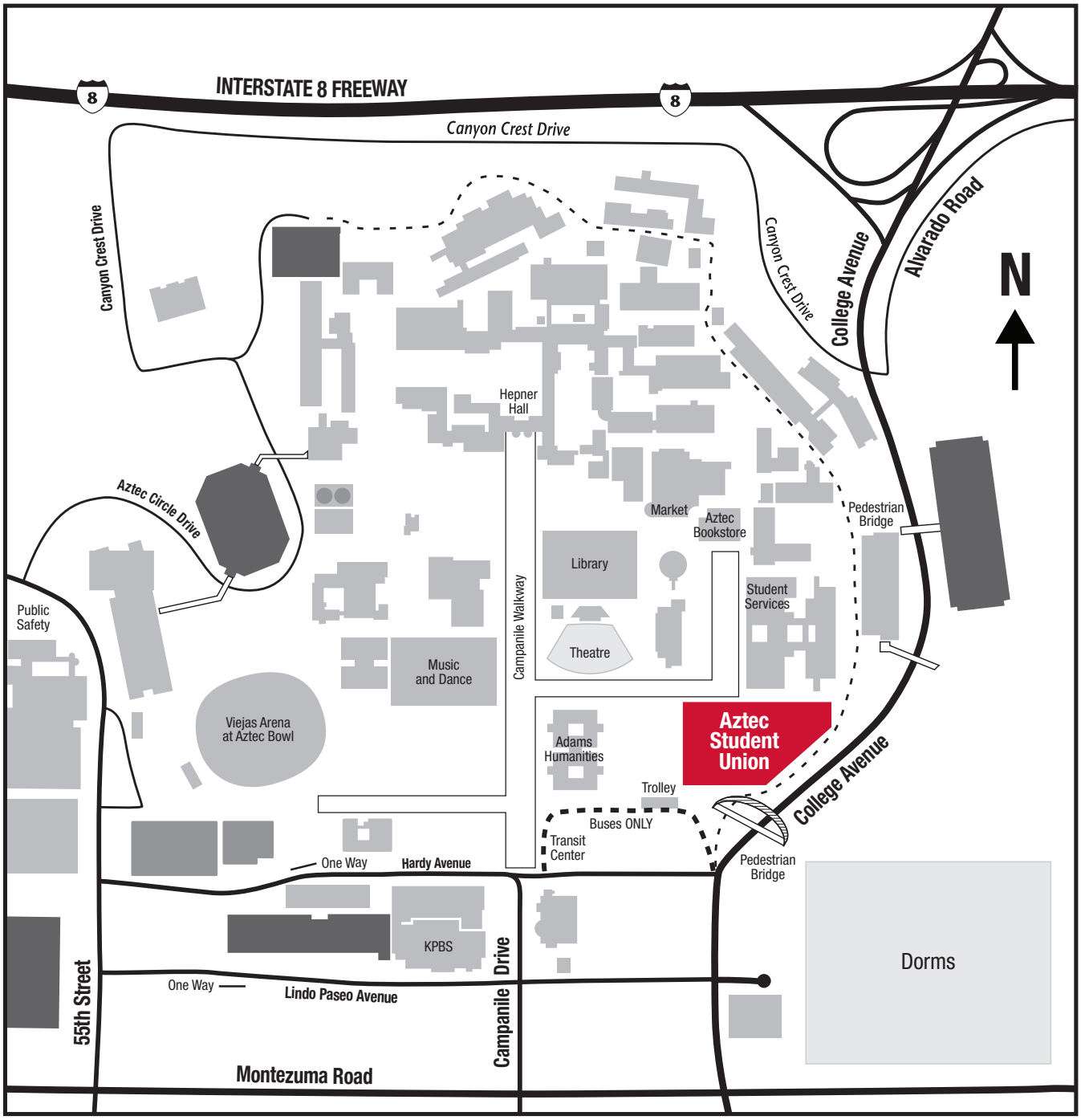
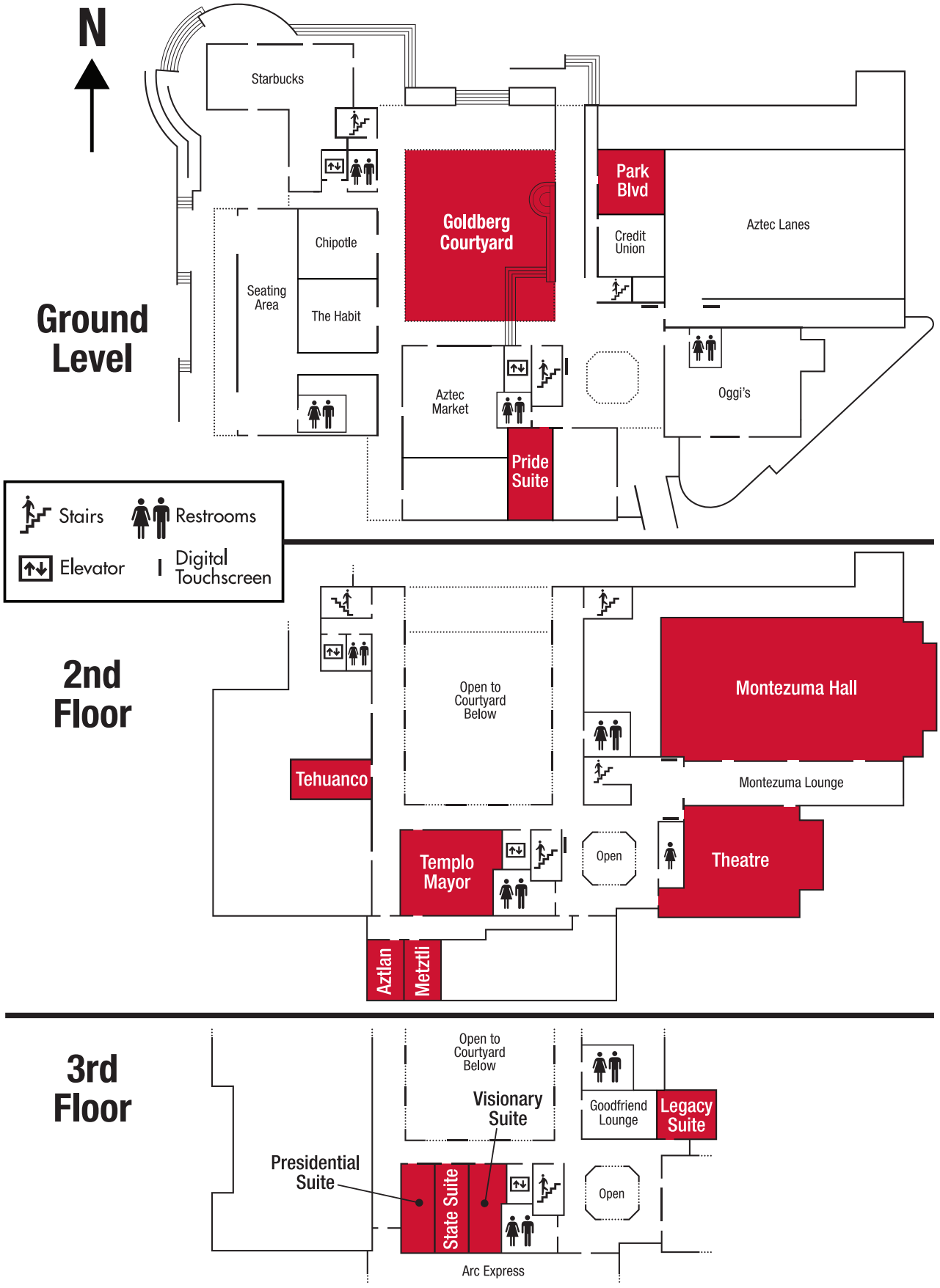
SAN DIEGO STATE UNIVERSITY CAMPUS MAP



AZTEC STUDENT UNION MAP



Adela de la Torre
President
San Diego State University

March 1, 2019

Dear colleagues and guests:

I want to welcome you to the 2019 Student Research Symposium at San Diego State University – the 12th year of this university-wide event that highlights the outstanding research and creative endeavors that distinguish SDSU. It is a wonderful opportunity to celebrate the innovation, academic scholarship and creativity that our undergraduate and graduate students bring to their research. It is also a forum for sharing their discoveries, insights, and performances with our university family and the broader community.

We are proud that over 300 students are presenting original work that emerged from academic and creative endeavors across the university. More than 65 of them will receive awards for excellence. 10 students whose entries are judged exceptional will represent SDSU at the annual California State University Student Research Competition in May.

I am proud of our phenomenal students, as well as our dedicated faculty and staff who have encouraged our student researchers and are coordinating this symposium. I am also grateful for the 200+ volunteers from our faculty and staff and the greater San Diego community who are gifting their time and expertise to evaluate the oral, poster, exhibit and performance presentations. Their dedication augments SDSU's commitment to cutting-edge research and creative endeavors.

This symposium represents the spirit of SDSU as a leading public research university and a vibrant expression of our emerging global citizens, compassionate leaders, and ethical innovators who will impact their communities and solve the world's greatest challenges.

My hope is that you will be inspired.

Adela de la Torre
President

Dr. Angel David Nieves
Associate Professor,
History and Digital Humanities,
San Diego State University

Angel David Nieves, Ph.D., is Associate Professor of History and Digital Humanities at San Diego State University (SDSU) in the Area of Excellence in Digital Humanities and Global Diversity. He was Associate Professor and Co-Director of the Digital Humanities Initiative (DHi) at Hamilton College (2008-2017). Nieves's 3D digital edition entitled, Apartheid Heritages: A Spatial History of South Africa's Township's(http://www.apartheidheritages.org) brings together modelling, immersive technologies and digital ethnography in the pursuit of documenting human rights violations in apartheid-era South Africa (Stanford University Press, under consideration). He recently completed a new book project entitled, An Architecture of Education: African American Women Design the New South, with the University of Rochester Press for their series "Gender and Race in American History" (June, 2018). Nieves is also currently working on a new volume in the Debates in the Digital Humanities Series (w/Senier & McGrail) and recently completed work on a special collaborative issue of American Quarterly (Fall 2018) on DH in the field of American Studies. He serves on the Modern Language Association's (MLA) Committee on Information Technology (2016-2019). He sits on the Boards of the New York State's Humanities Council (2017-2020) and the Society for American City and Regional Planning History (2018-2021). Nieves (2017-2018) was Presidential Visiting Associate Professor at Yale University in the Women's, Gender, and Sexuality Studies Program and an affiliate in the Yale Digital Humanities Laboratory (DHLab).

Thursday, February 28, 2019 - Registration

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

Friday, March 1, 2019 - Opening Remarks

8:30 am – 9:00 am Adela de la Torre, President, SDSU Aztec Student Union, Theatre, Room 270

Friday, March 1, 2019 - 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	Engineering and Computer Sciences 1	Pride Suite
	A-2	Oral	Physical and Mathematical Sciences 1	Park Boulevard
	A-3	Oral	Interdisciplinary 1	Tehuanco
	A-4	Oral	Humanities, History, Literature, Philosophy 1	Aztlan
	A-5	Oral	Interdisciplinary 2	Metztli
	A-6	Oral	Education 1	Templo Mayor
	A-7	Oral	Behavior and Social Sciences 1	Visionary Suite
	A-8	Oral	Behavior and Social Sciences 2	Legacy Suite
9:00 am	A-9	Poster	Health and Nutrition and Clinical Sciences 1	Montezuma Hall
	A-10	Poster	Health and Nutrition and Clinical Sciences 2	Montezuma Hall
	A-11	Poster	Health and Nutrition and Clinical Sciences 3	Montezuma Hall
	A-12	Poster	Behavior and Social Sciences 3	Montezuma Hall
	A-13	Poster	Behavior and Social Sciences 4	Montezuma Hall
	A-14	Poster	Engineering and Computer Sciences 2	Montezuma Hall
	A-15	Poster	Physical and Mathematical Sciences 2	Montezuma Hall
	A-16	Poster	Physical and Mathematical Sciences 3	Montezuma Hall
	A-17	Poster	Education 2	Montezuma Hall
11:00 am	B-1	Oral	Biological and Agricultural 1	Pride Suite
	B-2	Oral	Interdisciplinary 3	Park Boulevard
	B-3	Oral	Interdisciplinary 4	Tehuanco
	B-4	Oral	Physical and Mathematical Sciences 4	Aztlan
	B-5	Oral	Physical and Mathematical Sciences 5	Metztli
	B-6	Oral	Behavior and Social Sciences 5	Templo Mayor
	B-7	Oral	Behavior and Social Sciences 6	Visionary Suite
	B-8	Oral	Behavior and Social Sciences 7	Legacy Suite
10:45 am	B-9	Poster	Engineering and Computer Sciences 3	Montezuma Hall
	B-10	Poster	Engineering and Computer Sciences 4	Montezuma Hall
	B-11	Poster	Physical and Mathematical Sciences 6	Montezuma Hall
	B-12	Poster	Physical and Mathematical Sciences 7	Montezuma Hall
	B-13	Poster	Behavior and Social Sciences 8	Montezuma Hall
	B-14	Poster	Behavior and Social Sciences 9	Montezuma Hall
	B-15	Poster	Education 3	Montezuma Hall
	B-16	Poster	Interdisciplinary 5	Montezuma Hall
	B-17	Poster	Health and Nutrition and Clinical Sciences 4	Montezuma Hall

Friday, March 1, 2019 - 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	Interdisciplinary 6	Pride Suite
	C-2	Oral	Interdisciplinary 7	Park Boulevard
	C-3	Oral	Interdisciplinary 8	Tehuanco
	C-4	Oral	Interdisciplinary 9	Aztlan
	C-5	Oral	Humanities, History, Literature, Philosophy 2	Metztli
	C-6	Oral	Engineering and Computer Sciences 5	Templo Mayor
	C-7	Oral	Behavior and Social Sciences 10	Visionary Suite
	C-8	Oral	Behavior and Social Sciences 11	Legacy Suite
12:30 pm	C-9	Poster	Behavior and Social Sciences 12	Montezuma Hall
	C-10	Poster	Behavior and Social Sciences 13	Montezuma Hall
	C-11	Poster	Behavior and Social Sciences 14	Montezuma Hall
	C-12	Poster	Engineering and Computer Sciences 6	Montezuma Hall
	C-13	Poster	Physical and Mathematical Sciences 8	Montezuma Hall
	C-14	Poster	Biological and Agricultural 2	Montezuma Hall
	C-15	Poster	Biological and Agricultural 3	Montezuma Hall
	C-16	Poster	Biological and Agricultural 4	Montezuma Hall
	C-17	Poster	Biological and Agricultural 5	Montezuma Hall
3:00 pm	D-1	Oral	Physical and Mathematical Sciences 9	Pride Suite
	D-2	Oral	Visual and Performing Arts 1	Park Boulevard
	D-3	Oral	Health and Nutrition and Clinical Sciences 5	Tehuanco
	D-4	Oral	Interdisciplinary 10	Aztlan
	D-5	Oral	Interdisciplinary 11	Metztli
	D-6	Oral	Behavior and Social Sciences 15	Templo Mayor
2:15 pm	D-9	Poster	Engineering and Computer Sciences 7	Montezuma Hall
	D-10	Poster	Biological and Agricultural 6	Montezuma Hall
	D-11	Poster	Biological and Agricultural 7	Montezuma Hall
	D-12	Poster	Biological and Agricultural 8	Montezuma Hall
	D-13	Poster	Biological and Agricultural 9	Montezuma Hall
	D-14	Poster	Physical and Mathematical Sciences 10	Montezuma Hall
	D-15	Poster	Behavior and Social Sciences 16	Montezuma Hall
	D-16	Poster	Behavior and Social Sciences 17	Montezuma Hall
	D-17	Poster	Interdisciplinary 12	Montezuma Hall
4:00 pm	E-1	Poster	Physical and Mathematical Sciences 11	Montezuma Hall
	E-2	Poster	Physical and Mathematical Sciences 12	Montezuma Hall
	E-3	Poster	Engineering and Computer Sciences 8	Montezuma Hall
	E-4	Poster	Engineering and Computer Sciences 9	Montezuma Hall
	E-5	Poster	Biological and Agricultural 10	Montezuma Hall
	E-6	Poster	Health and Nutrition and Clinical Sciences 6	Montezuma Hall
	E-7	Poster	Behavior and Social Sciences 18	Montezuma Hall
	E-8	Poster	Behavior and Social Sciences 19	Montezuma Hall
9:00 am	F-1	Exhibit	Exhibit 1	Montezuma Hall
1:30 pm	G-1	Performance Arts	Performance Arts 1	Montezuma Theatre

Saturday, March 2, 2019 - 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	H01	Oral	Interdisciplinary 13	Pride Suite
	H02	Oral	Interdisciplinary 14	Park Boulevard
	H03	Oral	Humanities, History, Literature, Philosophy 3	Tehuanco
	H04	Oral	Physical and Mathematical Sciences 13	Aztlan
	H05	Oral	Behavior and Social Sciences 20	Metztli
	H06	Oral	Interdisciplinary 15	Templo Mayor
11:00 am	I01	Oral	Interdisciplinary 16	Pride Suite
	I02	Oral	Humanities, History, Literature, Philosophy 4	Park Boulevard
	I03	Oral	Behavior and Social Sciences 21	Tehuanco

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 2, 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 26-27, 2019 at California State University, Fullerton.

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.

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.

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.

Sustainability Award

The Center for regional Sustainability will award $250 to the best sustainability-related presentation.

A Note About The Awards

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

Saturday, March 2, 2019

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 2019 Student Research Symposium

Welcome
Keynote Address
Awards *

Undergraduate Research Excellence Awards

Research Awards for Diversity, Inclusion and Social Justice

Philosophy Award

Library Awards

Sustainability Award

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.

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

SCRS

Creative Arts Exhibits and Presentations

Friday, March 1, 2019

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.

SAN DIEGO STATE UNIVERSITY

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Friday, March 1, 2019
Session F: Creative Arts Exhibits

Session F-1

Exhibit 1
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

538 9:00 am WW
The Scenic Design of "Mas"
Adam Parrocha, Theatre Arts - Design and Technology for the Theatre (Scenic Design) (M)

Friday, March 1, 2019
Session G: Creative Arts Presentations

Session G-1

Performance Arts Performance Arts 1
Friday, March 1, 2019, 1:30 pm
Location: Montezuma Theater

539 1:30 pm
Glow
Kaylee Arca, Journalism (U)

540 1:50 pm
Disappearing Act
Brenda Taulbee, Creative Writing, Poetry (M)

541 2:10 pm
In-Between Blood
Celeste Morales, Creative Writing (M)

542 2:30 pm
4 EKGs in A Minor: A Piece for Peace for Our Time and for All Time
Andres Wong, BM Professional Studies General (U)

543 2:50 pm
Nathaniel the Goldfinch
Sean Coolican, MFA Creative Writing, Fiction (M)

544 3:10 pm
"Atena"
Jenna Castillo, Television, Film, and New Media - Production (U)

545 3:30 pm
Embodied emotions in performance
Zack King, Dance (U)

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SRS

Oral Presentations

Friday, March 1, 2019

Sessions A, B, C and D

Saturday, March 2, 2019

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.

SAN DIEGO STATE UNIVERSITY

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Friday, March 1, 2019
Session A: Oral Presentations

Session A-1

Oral Engineering and Computer Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Pride Suite

100 9:00 am
Calculation of 2D Flame Structure For Premixed Axisymmetric Stagnation Flames
Jeremy Brunnenmeyer, Mechanical Engineering (U)

101 9:15 am
Deployable Support Framework for the Mars Base
Beqa Mikadze, Electrical Engineering (U)

102 9:30 am
Numerical Model of a Concentrated Solar Power Combined Cycle Plant with Sensible Thermal Energy Storage
Edwin Gonzalez, Mechanical Engineering (M)

103 9:45 am
Fabrication of Binary Manganese Oxide - Carbon Films by Flame Assisted Deposition with Tuned Metal Oxidation and Carbon sp 2 Bonding
Aleksandr Aleshin, Mechanical Engineering (M)

104 10:00 am
Evolution of sp2 carbon bonding on nanoparticles formed in premixed stagnation flames at elevated temperature and equivalence ratio
Shruthi Dasappa, Mechanical Engineering (D)

105 10:15 am
Flames in Space: Radiation and Image Analysis
Luca Carmignani, Mechanical and Aerospace Engineering (D)

Session A-2

Oral Physical and Mathematical Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Park Boulevard

106 9:00 am
Ultrasensitive Detection of Cancer Biomarker CEA Using Multi-Photon Nonlinear Laser Wave-Mixing Spectroscopy
Taylor Inouye, Chemistry (U)

107 9:15 am
Sensitive Detection of Pancreatic Cancer Biomarkers Using Microfluidics and Nonlinear Multi-Photon Laser Wave-Mixing Detector
Samantha Crawford, Chemistry, (U)

108 9:30 am
Oxygen: cycling and inracellular production in methylotuvimicrobium alcaliphilum
Snehal Nariya, Microbiology (M)

109 9:45 am
Synthesis and Photophysical Properties of Modified Nucleic Acid Oligonucleotides with Fluorescent Tricyclic Cytidine
Marc Turner, Chemistry & Biochemistry (D)

110 10:00 am
Leveraging atropisomerism to obtain selective kinase inhibitors
Sean Toenjes, Chemistry (D)

111 10:15 am
Applications of VMAR for the construction of Lagunamide A
Monny Singh, Chemistry (D)

Session A-3

Oral Interdisciplinary 1
Friday, March 1, 2019, 9:00 am
Location: Tehuanco

112 9:00 am
California Wildfire Mapping
Austin Westphal, B.S. in Geography with an emphasis in Geographic Information Science (U)

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113 9:15 am
Analyzing the Presence, in Humans, of crAssphage: A Highly Abundant Bacteriophage Found Around the Globe
Holly Norman, Microbiology - CLS (U)

114 9:30 am
Modeling the lilac wildfire evacuation with cellular data
Benjamin Melendez, Civil Engineering (M)

115 9:45 am
Climate Change Impacts on Winegrowing Regions in Southern California: From the Perspective of a Regional Climate Model
Corrie Monteverde, M.Sc. Geography, emphasis Watershed Science (M)

116 10:00 am
Developing a Hydrologic Model to Assess Watershed Sustainability
Jack Mikesell, Civil Engineering - Water Resources Engineering (M)

117 10:15 am
In the Interest of Time: Influence of rainfall temporal resolution on modeled streamflow and hydrologic metrics in southern Californian watersheds
Kelly Flint, Masters in Civil Engineering with a specialization in Water Resources Engineering (M)

118 10:30 am
Understanding groundwater variability: modeling groundwater storage change in southern California
David Rother, Geography (D)

Session A-4

Oral Humanities, History, Literature, Philosophy 1
Friday, March 1, 2019, 9:00 am
Location: Aztlan

119 9:00 am
Caught between two worlds: the san francisco bisexual center, 1976 - 1985
Benjamin Calabrese, History (U)

120 9:15 am
The Fight for Tecolote Canyon and the Women Who Led It: Feminism and Environmental Politics in San Diego, CA 1960s-1970s
Shannon Farnsworth, History and Anthropology (U)

121 9:30 am
Collaboratively Geo-Designing SDSU West
Nguyen Tran, Computer Science (U)

122 9:45 am
The Sacramento Squatters' Riots of 1850
Eric Johnson, History (M)

123 10:00 am
Activism on the DL: The Gay Liberation Front at SDSU
John Gove, History (M)

124 10:15 am
North Park: Decaffeinated Difference
David Bethe, History (M)

Session A-5

Oral Interdisciplinary 2
Friday, March 1, 2019, 9:00 am
Location: Metztli

125 9:00 am
Examining human risk perception and decision makings toward wildfire evacuation
Ken Tominaga, Geography (U)

126 9:15 am
Computational Erosion Modeling of Archaeological Sites on San Miguel Island
Yesenia Garcia, Anthropology (M)

127 9:30 am
Impact of the Quantification Settlement Agreement on Hydrology of the Imperial Valley, California
Gabriela Morales, Geography (M)

128 9:45 am
Comparison of Three Methods of Simulating Wind Flow over Large Computational Domains
Brady Ells, Mechanical Engineering (M)

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129 10:00 am
Building a Spatial Social Network of Public Discourse in Social Media (Twitter)
Jaehee Park, Geography (D)

Session A-6

Oral Education 1
Friday, March 1, 2019, 9:00 am
Location: Templo Mayor

130 9:00 am
"It was hard, and it still is...": Women of Color Navigating HSI STEM Transfer Pathways
Briana Marquez, Communication (U)

131 9:15 am
Communicating Restorative Practices in an Urban Public High School
Gloria Villarruel, Communication (U)

132 9:30 am
Love the skin you are in: The Effects of Racial Affinity on Stress due to Health Concerns for Community College Students
Nexi Delgado, Education (D)

133 9:45 am
Navigating Identity
Darielle Blevins, Education (D)

134 10:00 am
The Impact of Dual Language Programs on Suspension Rates of Black Males
Reka Barton, Education (D)

135 10:15 am
Investigating How Secondary Mathematics Teachers' Use of Curriculum Materials can Support English Learners' Engagement in Mathematical Practices
Lynda Wynn, Mathematics and Science Education (D)

Session A-7

Oral Behavior and Social Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Visionary Suite

136 9:00 am
Eating Disorders and Neurocognition: Results from a Nationally Represenatitive Sample
Da Yeoun Moon, Psychology (U)

137 9:15 am
Hospital Ownership and Location Increasing Health Disparities Among Medicare Recipients
Alanah Kayla Castillo, Public Health (U)

138 9:30 am
Characterizing Information Structures and Processes Related to Cancer Screening in U.S Medicare Population
Melissa Yakuta, Business Management Information Systems (U)

139 9:45 am
HIV infection association with TB loss to follow-up among a presumptive TB cohort of rural Uganda
Briana Thrift, Epidemiology (M)

140 10:00 am
Predicting HIV viral suppression by 12 months after HIV diagnosis in Rural Uganda
Alexandra Almeida, Interdisciplinary Research on Substance Use (D)

141 10:15 am
Its about time: mitigation of lexical access delays in aphasia
Carolyn Baker, History (D)

Session A-8

Oral Behavior and Social Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Legacy Suite

142 9:00 am
Management of Complainability on an Online Review Platform: An Examination of the "Doctor" Category on Yelp
Justin Alecock, International Business (U)

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143 9:15 am
Sex-related bias in arrow-based Simon task
Adam Freudenberg, Philosophy (U)

144 9:30 am
Journalist–Practitioner Relationships: Measuring Coast Guard Public Affairs Media Relations and Framed News Values
Jason Neiman, Mass Communication and Media Studies (M)

145 9:45 am
Illegal and Legal Immigration and its Relation to Media in the San Diego-Tijuana Borderlands
Jesus Dominguez, Mass Communication and Media Studies (M)

146 10:00 am
Filling in the Gaps: A Needs Analysis of Refugee Students in Secondary Settings
Olivia Mullen, Applied Linguistics/TESOL (M)

147 10:15 am
Looking Beyond the Walls of Academia: Using Praxis for Student Instruction
Charlene Holkenbrink-Monk, Education (D)

Friday, March 1, 2019
Session B: Oral Presentations

Session B-1

Oral Biological and Agricultural 1
Friday, March 1, 2019, 11:00 am
Location: Pride Suite

201 11:00 am
Generation and Characterization of Isogenic iPSC Models with Copy Number Variations Linked to Autism Spectrum Disorder
Josephine Chu, Biology emphasis in Cell and Molecular Biology (U)

202 11:15 am
The effect of oxidation and post translational modification on isocitrate dehydrogenase 1 (IDH1) activity
Viraj Upadhye, Biology (U)

203 11:30 am
Examining the proliferative potential of the atrial cardiomyocyte
Jeffrey Jones, Biology (U)

204 11:45 am
A novel immunotherapy, VAX014, mediates tumor regression and immune cell infiltration in a mouse model of melanoma
Katherine Reil, Cell and Molecular Biology (M)

205 12:00 pm
Modifying the Gal-4 Assay to Test for Host Substrates Cleaved by Dengue and Zika Protease
Nina Barr, Cellular and Molecular Biology Masters Program (M)

206 12:15 pm
Linking Multi-Omics and Ultrastructure to Function in Methylotuvimicrobium
David Collins, Cell and Molecular Biology (D)

207 12:30 pm
A role for bacteria in the development of the marine tubeworm hydroides elegans via regulation of the Protein Kinase C pathaway
Kyle Malter, Cell and Molecular Biology (D)

Session B-2

Oral Interdisciplinary 3
Friday, March 1, 2019, 11:00 am
Location: Park Boulevard

208 11:00 am
Isolation versus Companionship in Other and Outsiders
Brooke Ochoa, Television, Film, and New Media (U)

209 11:15 am
Picking Your Poisons: Determining Veneno-magical Characteristics through the Greek Magical Papyri in Translation
Johnny Larson, History (M)

210 11:30 am
Plagues, Nazi Germany, and Vampires: An Alternative Insight Into the Rat Imagery in F.W. Murnau's Nosferatu
William Lambert, Creative Writing (M)

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211 11:45 am
Simone de Beauvoir and Third Cinema: A Feminist Dialogue
Andrea Alvarado, History (M)

212 12:00 pm
Fictionalism and Creatures of Fiction
Michael Lin, Philosophy (M)

Session B-3

Oral Interdisciplinary 4
Friday, March 1, 2019, 11:00 am
Location: Tehuanco

213 11:00 am
Fatigue Performance of a Nanocrystalline Structure
Ken Ramirez, Mechanical Engineering (U)

214 11:30 am
Zinc-Intercalated 1T-MoS2 on Si Nanowires for Photoelectrochemical Hydrogen Generation
Sabrina Younan, Chemistry (M)

215 11:45 am
Integration and Testing of Concentrated Full Spectrum Optimized Hybrid CPV/T System
Naman Gupta, Mechanical Engineering (M)

216 12:00 pm
Nondestructive Evaluation of Mechanical Behavior in Polymers using Terahertz Time-Domain Spectroscopy
Nha Uyen Huynh, Mechanical Engineering (D)

217 12:15 pm
Triple dipping: magnetic, capacitance, and acoustic wireless energy transfer through strain-mediated composite multiferroics
Scott Newacheck, Mechanical Engineering (D)

218 12:30 pm
Effect of Creep Loading on the Performance of E-Glass/Vinyl-ester Laminated Composites
Geovana C. V. Pessoa, Mechanical Engineering (D)

Session B-4

Oral Physical and Mathematical Sciences 4
Friday, March 1, 2019, 11:00 am
Location: Aztlan

219 11:00 am
Quark Matter in the Cores of Neutron Stars
Delaney Farrell, Physics (U)

220 11:15 am
The Speed of Sound in Ultra-Dense Matter
Aksel Alp, Physics (U)

221 11:30 am
Composition of Proto-Neutron Star Matter
Ian Maloney, Department of Physics (U)

222 11:45 am
Probing the Circumgalactic Medium at z~2 using Close Quasar Pairs
Stephanie Stawinski, Astronomy (M)

223 12:00 pm
Dense Matter Calculations with the Relativistic Hartree-Fock Method
Ezra Hart, Physics (M)

Session B-5

Oral Physical and Mathematical Sciences 5
Friday, March 1, 2019, 11:00 am
Location: Metztli

224 11:00 am
Healthcare
Mariam Mikava, Computer Engineering (U)

225 11:15 am
Evaluation of an artificial pulse for Left Ventricular Assist Devices
Sean Ortiz, Mechanical Engineering (U)

226 11:30 am
Development of a non-invasive muscle force sensor
Rene Arvizu, Mechanical Engineering with Bioengineering emphasis (U)

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227 11:45 am
Bilayer Passive/Active Polymer Protective Armors
Sterlen Barnes, Mechaniclal Engineering (M)

228 12:00 pm
A 500 pW Analog ECG Processor for Real Time R-wave Detection Based on Pan-Tompkins Algorithm
Cihan Gungor, Electrical & Computer Engineering (D)

229 12:15 pm
Aortic insufficiency during Left Ventricle Assist Device support: a mock loop study
Vi Vu, Mechanical Engineering (D)

Session B-6

Oral Behavior and Social Sciences 5
Friday, March 1, 2019, 11:00 am
Location: Templo Mayor

230 11:00 am
Variation in Communication Style Across Spanish- and English-Speaking Parent-Child Dyads During Free Play
Allyson Masters, Psychology (M)

231 11:15 am
A Comparison of Vaccination and Hospitalization Among Pediatric Pertussis Cases in California By Language of Interview
Sandra Yun, Master of Public Health (M)

232 11:30 am
The role of working memory and cognitive control in online sentence processing: A comparison between bilingual and monolingual speakers
Niloofar Akhavan, Language and communicative disorders (D)

233 11:45 pm
Can bilingual children capitalize on cross-language similarities to learn new words?
Quynh Dam, Language and communication disorders (D)

234 12:00 pm
An Electrophysiological Investigation of Cognitive Processing During Word Learning in Bilingual School-Aged Children
Cristy Sotomayor, Language and Communicative Disorders (D)

235 12:15 pm
Is a dog closer to a wolf or a bone? : Comparing taxonomic and thematic semantic relationships
Elizabeth Anderson, Language and Communicative Disorders (D)

Session B-7

Oral Behavior and Social Sciences 6
Friday, March 1, 2019, 11:00 am
Location: Visionary Suite

236 11:00 am
Cultural Influences of Lung Cancer Risk Among Young Sexual Minority Latino Men
David Rivera, Psychology (U)

237 11:15 am
A qualitative introduction to understanding cultural beliefs and health care utilization in rural Paraguay
Jennifer Beckner Schneider, MA Latin American Studies; MPH Health Promotion & Behavioral Studies (M)

238 11:30 am
Are Mexican-origin young adults living in an urban community more likely to have accessed dental care in the last year than those living in a rural community?
Sandra Oliva, Public Health - Health Management and Policy (M)

239 11:45 am
Oral hygiene behavior change among Mexican-origin adults after U.S. Migration
Mireya Mateo-Gomez, Public Health and Latin American Studies (M)

240 12:00 pm
Correlates of Ciclovía Participation in Bogota, Colombia
Maria Esther Camargo Diaz, Master's in Public Health and M.A. in Latin American Studies (M)

241 12:15 pm
Relationships of Sleep Duration and Variability with Overall Physical Activity in the Hispanic Community Health Study/Study of Latinos Sueño Ancillary Study
Kimberly Savin, Clinical Psychology (D)

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Session B-8

Oral Behavior and Social Sciences 7
Friday, March 1, 2019, 11:00 am
Location: Legacy Suite

242 11:00 am
Impact of Hand-Held Media on Child Food Consumption
Salvina Rondoni, Child and Family Development (U)

243 11:15 am
"I can see the disappointment in her face": Communicative Patterns in Disclosing Childfree Status between Mothers and Daughters
Evelyn Puga, Communication (M)

244 11:30 am
Parent and Child Cultural Orientations and its Relationship to Treatment Goal Agreement
Raymond La, Psychology (M)

245 11:45 am
Does Childhood Maltreatment Affect Older Adult Cognitive Function? A Life Course Inquiry
Brooke Silveria, Social Work (M)

246 12:00 pm
The Influence of Perceived Neighborhood Safety and Parental Influence on Adolescent Antisocial Behavior: A Longitudinal Study
Sarah Chavez, Research in Substance Use (D)

247 12:15 pm
Gender Differences in Caregiver Engagement when Devices are Present During Meals at Restaurants
Heather Jaffe, Education (D)

Friday, March 1, 2019
Session C: Oral Presentations

Session C-1

Oral Interdisciplinary 6
Friday, March 1, 2019, 1:00 pm
Location: Pride Suite

303 1:00 pm
Presence of phage-encoded Staphylococcal enterotoxin A gene in aquatic and terrestrial environments
Anh Nguyen, Biology (U)

304 1:15 pm
Predicting the Fate and Transport of Pathogens in Wastewater Treatment
Lorelay Mendoza, Environmental Engineering (U)

305 1:30 pm
Using Stable Isotopes in Determining Local v. Imported Waters in San Diego County Streams
Hannah Carney, Geological Sciences- Hydrogeology Emphasis (U)

306 1:45 pm
Tracking of Bacterial and Chemical Markers During Storm Events in San Diego River and Its Tributary
Federick Pinongcos, Environmental Engineering (M)

307 2:00 pm
Metagenomic Study of the Pure Water Program in San Diego, CA
Amanda Pham, Public Health (M)

308 2:15 pm
Quantifying the Impacts of Vegetative Channel Maintenance on Hydraulic Processes
Kyler Stevenson, Civil Engineering - Water Resources Engineering (M)

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Session C-2

Oral Interdisciplinary 7
Friday, March 1, 2019, 1:00 pm
Location: Park Boulevard

309 1:00 pm
The key to identifying San Diego's fairy shrimp
Andrea Albarran, Biology (U)

310 1:15 pm
Effects of a non-native swimming crab on the native California horn snail
Melissa Belen-Gonzalez, Biology (U)

311 1:30 pm
Community Metabolism of Eelgrass Beds in the San Diego Bay: Carbon Sink or Source?
Abigail Ryder, Ecology (M)

312 1:45 pm
Assessing the distribution and impact of marine endocrine disrupting compounds in the critically endangered California condor and marine mammals
Margaret Stack, Environmental Health (M)

313 2:00 pm
Thesis Proposal: Efficiency, Affordability and Scalability of Technologies for the Recovery of Phosphorus from Wastewater
Emily Saban, Environmental Engineering (M)

314 2:15 pm
Quantification of Non-Point Source Contaminants from Homeless Encampments in a Semi-Arid Urban Watershed
Jose Calderon, CIVIL ENGINEERING ENVIRONMENTAL ENGINEERING (M)

Session C-3

Oral Interdisciplinary 8
Friday, March 1, 2019, 1:00 pm
Location: Tehuanco

315 1:00 pm
Changing subsistence patterns: How the second industrial revolution impacted life at the Harrison Homestead
Jamie Bastide, Anthropology and Geological Sciences (U)

316 1:15 pm
SNAPc Interacts with Bdp1 to Establish a Stable Protein-DNA Complex with TBP on a U6 snRNA Gene Promoter
Angela Wolfe, Biochemistry (U)

317 1:30 pm
Traditional Chinese Philosophy and Toxic Masculinity
Sarah Camara, Linguistics (U)

318 1:45 pm
Food, nostalgia, and home on the U.S./Mexico border: The palimpsest of memory in the creation of home and imagined futures
Sandra Kirkwood, Anthropology (M)

319 2:00 pm
The Parent Role in the Families of Parachute Kids from Mainland China
Kimberly Gan, Sociology (M)

320 2:15 pm
The Paradox of Tourism on Easter Island: Helping and Harming Rapa Nui Culture
Jesse Tenenbaum, Geography (M)

Session C-4

Oral Interdisciplinary 9
Friday, March 1, 2019, 1:00 pm
Location: Aztlan

321 1:00 pm
The Impact of Commodity Price and Volatility on Deforestation in Suitable Regions
Alicia Marquez, Environmental Science (U)

322 1:15 pm
The Role of Motivation and Behaviorally Evoked Responsiveness in Pit Vipers
Amy Orduno-Baez, Biology with an emphasis in Ecology (U)

323 1:30 pm
Growth of indigenous versus hybrid corns in milpa with different soils
Cassandra Maya, Nutritional Sciences (M)

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324 1:45 pm
Interspecies Hybridization in Pinyon Pines and its Consequences on Symbiotic Ectomycorrhizal Communities
Ryan Buck, Evolutionary Biology (M)

325 2:00 pm
Phylogenetic Reconstruction and Population Structure Analysis of the Genus Arbutus Using Next Generation Sequencing
Alexandra McElwee-Adame, Evolutionary Biology (M)

326 2:15 pm
The Virtual Standardized Patient
Helina Hoyt, Education (D)

Session C-5

Oral Humanities, History, Literature, Philosophy 2
Friday, March 1, 2019, 1:00 pm
Location: Metztli

327 1:00 pm
Marx v Stirner on Freedom
Mija Pritchard, Philosophy (U)

328 1:15 pm
The Implications of "Believe All Women:" An Epistemological Critique of the "Me, too" Movement
Thomas Gustafson, Philosophy (M)

329 1:30 pm
Marx on Gender
Tawny Whaley, Philosophy (M)

330 1:45 pm
Post-truth and Epistemic Hedonism
Brandon Walton, Philosophy (M)

331 2:00 pm
Epistemic Suicide: Foucauldian "instruction" on the structure of institutional racism within the field of study in anthropology at San Diego State University
Monica Gonzalez, Philosophy (M)

Session C-6

Oral Engineering and Computer Sciences 5
Friday, March 1, 2019, 1:00 pm
Location: Templo Mayor

332 1:00 pm
Isolation Improvement of Two Dual-band 900 MHz Planar Inverted-F Antennas
Tommy Khoury, Electrical Engineering (U)

333 1:15 pm
Wireless sensor network with IoT frameworks for sleep monitoring
Kim Phan, Electrical Engineering (M)

334 1:30 pm
Wide Angle Beam Steering Cylindrical Parabolic Reflector with Phased Array as a Feed Source for Ku-Band Applications
Ghanshyam Mishra, Computational Science (D)

335 1:45 pm
Studies on mechanical deformation fundamentals in nanoscale pure metal magnesium using supercomputer-based simulations
Md. Shahrier Hasan, Engineering Science(Mechanical and Aerospace) (D)

336 2:00 pm
A Novel Bandwidth Allocation Scheme Using Stackelberg Game for Wireless Communication
Krishna Murthy Kattiyan Ramamoorthy, Computational Science (D)

337 2:15 pm
Toward a Smart Stethoscope: Correlation between trachea internal air pathway geometry and the auscultation signal response
Mohamed Amine Abassi, Mechanical and Aerospace Engineering (D)

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Session C-7

Oral Behavior and Social Sciences 10
Friday, March 1, 2019, 1:00 pm
Location: Visionary Suite

338 1:00 pm
Performing Masculinity as a Stroke Survivor and Advocate
Marcella Anderson, Foods and Nutritional Sciences (U)

339 1:15 pm
No, It Should Be a Boy: The Outcome of Gender-selective Abortion Policy in Contemporary China
Yuwei Liu, International Business (U)

340 1:30 pm
Perceptual and Attitudinal Body image, Disordered Eating and Muscularity-Orientated Behavior in Men
Boyu Wei, Psychology (U)

341 1:45 pm
Women's Experiences of Communicating Intimacy and Sex Education
Sarah Tellesen, Communication (M)

342 2:00 pm
Predictors of Intimate Partner Violence (IPV) among Peruvian Men: An Ecological Perspective
Maria Milla, Dual Masters of Public Health and Latin American Studies - Health Promotion (M)

343 2:15 pm
Amor y Frontera: Naming the significant other among Mexican female Spanish speakers
Fernanda Vega, Women Studies (M)

Session C-8

Oral Behavior and Social Sciences 11
Friday, March 1, 2019, 1:00 pm
Location: Legacy Suite

344 1:00 pm
Communicating Sexual Violence in FratMANers to Create Change
Harsh Varshney, Health Communication (U)

345 1:15 pm
This is OUR Church: A study of community in a local San Diego church
Raegan Jobe, Health Communications (U)

346 1:30 pm
Communicating A Way Out: A Qualitative Study of a Queer STEM Community
Kaysia Pajita, Health Communication (U)

347 1:45 pm
"Every Time She Opened Her Mouth I Was Scared… How Do I React?! What Do I Say?!" Exploring Dialectical Tensions in Confidant Perspectives of Social Support to Survivors of Sexual Assault
Danielle Biss, Communication (M)

348 2:00 pm
"Isolating Myself from the Rest of My Life," An Analysis of Institutional Discrimination of Feminine- Identifying in the Evangelical Church
Kara Sutton, Communication (M)

349 2:15 pm
"Nobody Wants to Listen to Girls Talk": Communicative Strategies for Resisting the Male-centric Industry of Stand-up Comedy
Laura Horton, Communication Studies (M)

Friday, March 1, 2019
Session D: Oral Presentations

Session D-1

Oral Physical and Mathematical Sciences 9
Friday, March 1, 2019, 3:00 pm
Location: Pride Suite

403 3:00 pm
Characterizing 2C10: an anti-double stranded DNA antibody
Citlayi Villaseñor, Chemistry - Emphasis in Biochemistry (U)

404 3:15 pm
Ba/F3 Cells in the Evaluation of a Novel Targeted Treatment Against the EGFR T790M Resistance Mutation in NSCLC Patients
Bryan Argueta, Chemistry (M)

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405 3:30 pm
Regioselective Halegonation of Phenol: Mechanistic Insights and Kinetic Studies of Lewis Base catalysts
Andrew Dinh, Chemistry (D)

406 3:45 pm
Synthesis of Novel Methylsulfoximine Small Molecule Derivatives Active against the Hepatitis C Virus
Kevin Walsworth, Chemistry (D)

407 4:00 pm
Developing Atroposelective Syntheses to Access Pharmaceutically Relevant Compounds
Mariel Cardenas, Chemistry (D)

408 4:15 pm
Discovery and Improvement of a Potent Nucleoside Analogue Produg Which Inhibits the RNA Dependent RNA-Polymerase of the Zika Virus
Michael Coste, Organic Chemistry (D)

Session D-2

Oral Visual and Performing Arts 1
Friday, March 1, 2019, 3:00 pm
Location: Park Boulevard

409 3:00 pm
The Challenges of the Female Director
Lauren Haughton Gillis, MFA Musical Theatre (M)

410 3:15 pm
Polishing the Lost Gems of Musical Theatre
Trist Fishman, Musical Theatre (M)

411 3:30 pm
We're All in This Together: The High School Musical Director's Guide to Building a Creative Team
Devon Hunt, Musical Theatre (M)

412 3:45 pm
The Choreographer Directs: Storytelling in Contemporary Dance
Eden Hildebrand, Theatre Arts; Musical Theatre (M)

413 4:00 pm
Change come fast and change come slow: "caroline, or change" presents the anti-mammy
James Morrison, Musical Theatre (M)

414 4:15 pm
Unfair, Inaccurate, or Just Plain Mean? An analysis of the representation of Christians in the arts
Shayne Mims, MFA in Musical Theatre (M)

Session D-3

Oral Health and Nutrition and Clinical Sciences 5
Friday, March 1, 2019, 3:00 pm
Location: Tehuanco

415 3:00 pm
A Gap in Access to Care: The Absence of Culturally and Linguistically Appropriate Services Burdens Limited-English Patients
Melissa Ruiz, Public Health (U)

416 3:15 pm
Effect of holiday season on energy balance and weight gain
Nicole Wells, Exercise Physiology, Nutritional Sciences (M)

417 3:30 pm
Sex Differences and the Apolipoprotein E4 allele in Olfactory Recognition Memory: An fMRI Study
Eleni Kapoulea, Psychology (M)

418 3:45 pm
Eccentric Hip Rotation Strength in Healthy Adults
Lukas Krumpl, Applied Movement Science (M)

419 4:00 pm
"Endure" and "Excuse": A Mixed-Methods Effort to Capture Disclosure of Intimate Partner Violence among HIV+ Women in Uganda
Brittnie Bloom, Public Health (D)

420 4:15 pm
Prevalence and correlates of HIV-status knowledge among men aged 15 – 59 years in rural central Uganda - Implications for HIV/AIDS response
Michael Ediau, Public Health (Global Health) (D)

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Session D-4

Oral Interdisciplinary 10
Friday, March 1, 2019, 3:00 pm
Location: Aztlan

421 3:00 pm
Roman Imperial Matrons: A History of Calculating Women From Livia to Julia Domna
Hannah Friesen, History (U)

422 3:15 pm
Constructing a Meaning of Freedom: A Gendered Perspective of the Actions of Formerly Enslaved Men and Women in the American South, 1860 – 1880
Scott Thiele, History (M)

423 3:30 pm
The W.I.T.C.Hing Hour: the forgotten history of W.I.T.C.H during the second wave of the Women's Rights Movement in the US
Jade Connolly-Cepurac, Double Major in History and Political Science (U)

424 3:45 pm
Finding A Place You Feel at Home: The Communicative Construction of Belonging at A Women's Resource Center
Kylie Lynch, Communication and Philosophy (U)

425 4:00 pm
AI trouble: Queer theory in the age of the intelligent machine
Gabrielle Peñaranda, Philosophy (M)

Session D-5

Oral Interdisciplinary 11
Friday, March 1, 2019, 3:00 pm
Location: Metztli

426 3:00 pm
University Supervisor Feedback To Teacher Candidates With High and Low Performing edTPA Scores Utilizing a Video-Based Coaching Tool
Brian Burgess, Psychology (U)

427 3:15 pm
Mechanical injury alters APP and BACE-1 interaction in hiPSC-derived neurons
My Tran, Psychology & Speech, Language and Hearing Sciences (U)

428 3:30 pm
Learning from the Past to Predict Future Funding Approaches and Research Breakthroughs
Gudur Ashrith Reddy, Bioengineering (D)

429 3:45 pm
Anatomical correlates of language connectivity-based subgrouping in autism spectrum disorders
Yangfeifei Gao, Clinical Psychology (D)

430 4:00 pm
Focal Abnormalities of Cortical Thickness in Adults with Autism Spectrum Disorders (ASDs)
Jiwandeep Kohli, Clinical Psychology (D)

Session D-6

Oral Behavior and Social Sciences 15
Friday, March 1, 2019, 3:00 pm
Location: Templo Mayor

431 3:00 pm
Neuroanatomical correlates of executive function in mature adults with Autism Spectrum Disorders
Ian Martindale, Psychology (U)

432 3:15 pm
Anxiety symptoms correlate with altered brain functional connectivity on MRI in mature adults with autism spectrum disorders
Ryan Tung, Psychology (U)

433 3:30 pm
Atypical Salience Network Connectivity in Toddlers with Autism Spectrum Disorders
Cynthia Ibarra, Psychology (M)

434 3:45 pm
Neural Indices of Hyperexcitability in Individuals with Fibromyalgia as a Function of Pharmacological Treatment
Denali Woodruff, Psychology (M)

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435 4:00 pm
Neural Dynamics of Contextual Processing and Word Learning
Jacob Momsen, JDP in Language and Communicative Disorders (D)

436 4:15 pm
Matching pictures and signs: an ERP study of the effects of iconicity and structural alignment in American Sign Language
Meghan McGarry, Speech, Language and Hearing Sciences (D)

Saturday, March 2, 2019
Session H: Oral Presentations

Session H-1

Oral Interdisciplinary 13
Saturday, March 2, 2019, 9:00 am
Location: Pride Suite

546 9:00 am
The Impact of Probiotics on Cortisol Metabolism
Nina Ly, Chemistry with an emphasis in biochemistry (U)

547 9:15 am
Identification of the epitope on CD4 that is recognized by the anti-HIV Q425 metalloantibody
Sally Luong, Biochemistry (U)

548 9:30 am
Cracking the Gut/Brain Axis with MAD Mice
Candice Lambert, Analytical Chemistry (M)

549 9:45 am
Oral Contraceptives on the Gut Brain Axis
Myedith Damba, Chemistry (M)

550 10:15 am
Discovering Novel Phages in the Human Gut
Melissa Giluso, Bioinformatics Medical Informatics (M)

551 10:30 am
The role of kinase activity in the biosynthesis of threonylcarbamoyl adenosine in bacteria
Naduni Paranagama, Biochemistry (D)

Session H-2

Oral Interdisciplinary 14
Saturday, March 2, 2019, 9:00 am
Location: Park Boulevard

552 9:00 am
Decolonizing the inner self
Martha Mondragon, History (U)

553 9:15 am
The Filipino-American Struggle: Descendants of the Colonized & Post-Colonial Identity Crisis
Rustico Rasing, History (U)

554 9:30 am
A hero in the shadow
Laure Gerard, History (U)

555 9:45 am
Jewish Immigrant Children in 20th-century America: Dangling between Two Worlds
Sara Fakhoury, History (U)

556 10:00 am
Beyond the Words of Genocide: Memory, Trauma and the Rwandan Genocide
Joshua Melendez, History (M)

Session H-3

Oral Humanities, History, Literature, Philosophy 3
Saturday, March 2, 2019, 9:00 am
Location: Tehuanco

557 9:00 am
The Black Freedom Struggle and the Cold War
Cassandra Tanks, History (U)

558 9:15 am
Winning the Battle But Losing the War: The Tet Offensive Through the Eyes of the Johnson Administration
Jeremy Mazur, History (U)

559 9:30 am
United States Keeps It Cool - Dave Brubeck Quartet's State Department Tour of 1958 and the Concert Series in Bombay, India
Michael Campbell, History (M)

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560 9:45 am
Play Only in the Sandbox: How the Johnson Administration Avoided a Sino-American War in Vietnam
Eugene Phillips, History (M)

561 10:00 am
The Hue Massacre of 1968
Cody Billock, History (M)

562 10:15 am
The Assault Youths and Vietnamese Cultural Militarism 1950-1975
Thanh Nguyen, Department of History (M)

Session H-4

Oral Physical and Mathematical Sciences 13
Saturday, March 2, 2019, 9:00 am
Location: Aztlan

563 9:00 am
Heteroatom Pendant Bases for Ruthenium Catalyzed Water Oxidation
Brett Vincenzini, Chemistry (U)

564 9:15 am
Novel Enantiopure N-Heterocyclic Carbene Half-Sandwich Ir(III) Iradacycle Complexes
Harrison Pearce, Chemical Physics (U)

565 9:30 am
Control of Bond Strength in H-Bond Dimers via Proton transfer Induced by Electron Transfer
Hyejeong Choi, Chemistry (M)

566 9:45 am
Electron Poor Phosphines and their Metal Complexes
Daniel Sattler, Chemistry (D)

567 10:00 am
Studies on the Design, Synthesis, and Reactivity of Phosphine Ligands Containing Protic Imidazolyl Groups
Braden Silva, Chemistry (D)

568 10:15 am
C-metallated Ligands for Water Oxidation Catalysis
Aaron Nash, Chemistry (D)

Session H-5

Oral Behavior and Social Sciences 20
Saturday, March 2, 2019, 9:00 am
Location: Metztli

569 9:00 am
Accounting for the Sampling Variability of the Mean and Standard Deviation when Conducting Simple Slopes Analysis
Emma Grossman, Statistics (U)

570 9:15 am
"The Box": Effects of San Diego Hepatitis A Outbreak on Transitional Aged Youth Using Photo Voice and Community Based Participatory Research
Talia Kieu, Public Health (U)

571 9:30 am
Exploring Effective Study Recruitment Strategies for Mexican-origin Young Adults
Felicia Angie Vengco, Public Health(Health Sciences) (U)

572 9:45 am
How do Electronic Health Records (EHR) Compare to Self-Reported Health Survey Data?
Lance Attiq, Public Health (U)

573 10:00 am
Rompiendo Fronteras: A Qualitative Investigation of Mentors and Gang-Involved Youth in Cali, Colombia
Tyler Linvill, Public Health & Latin American Studies (M)

574 10:15 am
Use of Community Based Participatory Research among Queer Adolescents
Amanda Farr, Public Health (M)

Session H-6

Oral Interdisciplinary 15
Saturday, March 2, 2019, 9:00 am
Location: Templo Mayor

575 9:00 am
Novel Extrapolations of Energy Calculations
Ken Luu, Physics (U)

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576 9:15 am
Novel su-8 based multi-layer microstructures for crispr applications
Colin O'Neill, Mechanical Engineering (M)

577 9:30 am
The Nuclear Equation of State as predicted by the Thomas-Fermi Model
Jon Parsons, Computational Science (M)

578 9:45 am
Modeling Intracellular Delay in Within-host HIV Dynamics under conditioning of Drugs of Abuse
Michael Peter, Applied Mathematics (M)

579 10:00 am
The investigation of moving objects through atmospheric turbulence from a nonstationary platform
Nicholas Ferrante, Applied Mathematics (M)

580 10:15 am
Machine learning of load-balancing for a large parallel code
Jordan Fox, Computational Science (D)

Saturday, March 2, 2019
Session I: Oral Presentations

Session I-1

Oral Interdisciplinary 16
Saturday, March 2, 2019, 11:00 am
Location: Pride Suite

581 11:00 am
Dr. Ben Yellen and His One-Man Crusade
Lynda Grijalva, Social Science Single Subject Teaching (U)

582 11:15 am
Caging for profits: Rethinking the neoliberal state and the rise of the prison industrial complex in the U.S.
ALIONA GALKINA, Human Geography and Global Studies (U)

583 11:30 am
Border Corruption along the United States Border
Moises Cardenas, Public Administration (U)

584 11:45 am
Automating Gesture Data Collection and Classification
Davit Soselia, Computer Engineering (U)

585 12:00 pm
US Troops and Economic Growth in Kuwait
Robert Lasater, Applied Economics (M)

Session I-2

Oral Humanities, History, Literature, Philosophy 4
Saturday, March 2, 2019, 11:00 am
Location: Park Boulevard

586 11:00 am
Personalities of Plato's Republic
Marcos Santana, Philosophy (U)

587 11:15 am
"Aristotle's De Anima: The Soul and Capacities"
Emilia Janda, Political Science and Philosophy (double) (U)

588 11:30 am
A Contemporary Discussion on Death
Alex Vicknair, Philosophy (U)

589 11:45 am
Aristotle on the Mind and the Parts of Time
Tiffany Harrington, Philosophy (M)

590 12:00 pm
To be is to Persist
Dustin Gray, Philosophy (M)

Session I-3

Oral Behavior and Social Sciences 21
Saturday, March 2, 2019, 11:00 am
Location: Tehuanco

591 11:00 am
Healing Young Minds: Community, Counseling, and Creativity
Tara Block, Public Administration (U)

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592 11:15 am

Empirical Implications of Lunch Break Perceptions on Workplace Outcomes

Christian Ampo, Psychology (U)

593 11:30 am

Understanding the Sociological Factors to the Opioid Crisis in Virginia

Alejandro Contreras, Public Administration (M)

594 11:45 am

Putting the “Participatory” & “Trauma-Informed” in Tobacco Control : A Systematic Review

Charles Marks, Interdisciplinary Research on Substance Use (D)

595 12:00 pm

Resistance Is Resilience

Myra Hollis, Marriage and Family Therapy (M)

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SRS

Poster Presentations

Friday, March 1, 2019

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.

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Friday, March 1, 2019
Session A: Poster Presentations

Session A-9

Poster Health and Nutrition and Clinical Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

148 9:00 am A
Real-Time Monitoring of Heart Failure Biomarker Atrial Natriuretic Peptide Using Ultrasensitive Laser Wave-Mixing Spectroscopic Detection
Irving Chavez, Biochemistry (U)

149 9:00 am B
An induced pluripotent stem cell (iPSC) model to study mechanisms of non-alcoholic fatty liver disease (NAFLD) associated with PNPLA3 polymorphisms in human hepatocytes
Bana Alani, Microbiology (U)

150 9:00 am C
Modeling Calcium Kinetics Of Neural Cognitive Disorders With hiPSC Derived Neuronal Cultures
Isaura Villalba, Cell and Molecular Biology (U)

151 9:00 am D
Post Translational Modifications in MDH1 May Affect Lung Cancer Survival
Sati Alexander, biology (U)

152 9:00 am E
HPV Vaccination in Pediatric Oncology Survivors
Yesenia Avitia, Microbiology with an emphasis in Clinical Laboratory Science and Public Health (U)

153 9:00 am F
Impact of Hospital Safety Net Burden on Oncology Patterns of Guideline Concordant Care
Katelyn Bachand, Biochemistry (U)

Session A-10

Poster Health and Nutrition and Clinical Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

154 9:00 am G
Isolation of Mealworm Tropomyosin, a Potential Cross-Reactive Food Allergen
Emily Woolf, Exercise Physiology and Nutrition (M)

155 9:00 am I
The Promising Effects of Brazil Nut Consumption on Postprandial Satiety, Glucose and Insulin Responses in a Healthy Population
Alison Rosenstock, Nutritional Sciences (M)

156 9:00 am J
Inhibition of enzymatic browning during protein isolation from mealworm (Tenebrio molitor) larvae
Shruti Shertukde, Foods and Nutrition (U)

157 9:00 am K
Effect of Dried Plum on Bone Health in Men
Jonnatan Fajardo, Nutritional Sciences (M)

158 9:00 am L
Effects of dried plum on bone biomarkers in men
Danielle Gaffen, Nutritional Sciences (M)

159 9:00 am M
Physicochemical Characteristics and Proximate Composition of Select Edible Insects in Oaxaca, Mexico
Autumn Stoll, Food and Nutrition (U)

Session A-11

Poster Health and Nutrition and Clinical Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

160 9:00 am N
Assessing the Utilization of GeneXpert MTB/RIF as a Rapid Diagnostic Tool in Mbale, Uganda
Saanjh Boyani, Masters of Public Health - Health Promotion & Behavioral Science (M)

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

161 9:00 am O
Identifying food security resources and strategies utilized by San Diego County low-income Hispanic/Latino residents
Jacqueline Ibarra, Foods and Nutrition (U)

162 9:00 am P
Examining Disparities of Depressive Distress Among LGBTQ Youth Before and After the 2016 U.S. Presidential Election
Adrian Marcos, Interdisciplinary Studies in Three Departments, Biology, English, Religious Studies (U)

163 9:00 am Q
The Quality of Care Delivery For Patients Living With Alzheimer's Disease and Related Dementias (ADRD) Who Are Diagnosed With Cancer: a Systematic Review
Britney Prince, Health Management & Policy (M)

164 9:00 am R
Disparity of Mobility Resources for People with Disabilities in Oaxaca, Mexico
Noelle Simpson, Master in Public Health and Master in Latin American Studies (M)

165 9:00 am S
Gender and Racial Disparities in Lung Cancer in Never-Smokers: Asian Women
Dania Meza Acosta, Biology (U)

Session A-12

Poster Behavior and Social Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

166 9:00 am T
White matter structure in middle-aged adults with autism spectrum disorders
Adam Schadler, Masters of Arts in Psychology (M)

167 9:00 am U
Balance performance in adults with autism spectrum disorder compared to typically developing adults
Chantal Chaaban, Psychology (U)

168 9:00 am V
U-fiber connections between primary and somatosensory cortex in older adults with ASDs
Ashley Baker, Psychology (U)

169 9:00 am W
Associations between couple conflict, fetal reactivity, and infant outcomes
Lena Barbakh, Biology and Child and Family Development (U)

170 9:00 am X
Behavioral Sensitization to Methylphenidate in C57BL/6J x FVB/NJ F1 Hybrid Mice with Prenatal Alcohol Exposure
Alicia Green, Psychology (U)

171 9:00 am Y
Creating a Psycho-Social Profile of School Shooters by Identifying Correlations
Nikolas Leon, Psychology (U)

Session A-13

Poster Behavior and Social Sciences 4
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

172 9:00 am Z
Parenting Style, Adolescent Irritability and the Potential Impact of Environmental Factors
Rebeccah Glisson, Psychology (U)

173 9:00 am AA
Associations between Irritability and Neuropsychological Correlates of Attention in Adolescents
Michael Liuzzi, Psychology (M)

174 9:00 am BB
Examining Gender Differences of Error-Related Negativity in Adolescents
Valery Quinonez, Psychology (U)

175 9:00 am CC
Relationship of Helping Attitudes and Personality Traits in College Students
Tareen Mekany, Psychology (U)

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176 9:00 am DD
Motivational effects of science stereotypes on first-generation college freshmen in science
Lauren McLeese, Psychology (U)

Session A-14

Poster Engineering and Computer Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

177 9:00 am EE
Wildfire detection using advanced optical communication in small satellites
Karl Parks, Aerospace Engineering (U)

178 9:00 am FF
Post-fire Peak Flow Estimates in Southern California
Brent Wilder, Civil Engineering, Water Resources Engineering (M)

179 9:00 am GG
Evaluating the Chemical Character of Organic Matter in an Urban Creek Impacted by a Fire
Denise Garcia, Environmental Engineering (U)

180 9:00 am HH
Heat induced polymeric stabilization of clays
Jonathan Cabrera, Civil Engineering (U)

181 9:00 am II
Calibration and Application of a Digital Camera for Ratio Pyrometry in the Narrow Channel Apparatus
Michael Berry, Mechanical Engineering (M)

182 9:00 am JJ
Post-Fire Effects on Turbidity in an Urban Environment
Kevin O'Marah, Civil Engineering (U)

Session A-15

Poster Physical and Mathematical Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

183 9:00 am KK
Modeling Avian Influenza Dynamics with Multiple Viral Strains Under Periodic Environmental Conditions
Jillian Kiefer, Applied Mathematics (U)

184 9:00 am LL
Role of immune status of virus-source partners on the transmission dynamics of HIV epidemics
Angelica Bloomquist, Applied Mathematics (M)

185 9:00 am MM
Modeling the effects of drugs of abuse on hiv infections with two viral species
Peter Uhl, Computational Science (D)

186 9:00 am NN
Use of Viral Dynamics Model in a Machine Learning Framework for Predicting Resting CD4+ T Cell Reservoirs of HIV-1
Kyle Lee, Statistics (M)

187 9:00 am OO
Modeling the Coral Reef Microbiome and Black Band Disease
Maya Weissman, Cellular and Molecular Biology (U)

188 9:00 am PP
Mathematical and computational models analyzing the effect of common toxins on embryonic development in the zebrafish model
Ashley Schwartz, Applied Mathematics (U)

Session A-16

Poster Physical and Mathematical Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

189 9:00 am QQ
California Condors' Exposure to Non-Halogenated Organic Contaminants at California Coast
Jade Johnson, Chemistry (U)

190 9:00 am RR
Beluga and Pacific White Sided Dolphin Whole Blood and Filter Paper Analysis of PCB
Pamela Olguin, Chemistry (U)

191 9:00 am SS
Evaluation of Alcohol Use Disorder in Mice Using Targeted Metabolomics
Elizabeth Costa, Chemistry with an emphasis in Biochemistry (U)

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192 9:00 am TT
Using Untargeted Metabolomics to Understand the Gut-Brain Axis
Brijinder Soni, Chemistry (M)

193 9:00 am UU
Synthesis of New HCV IRES Ligands
Anthony Simon, Chemistry Emphasis in Biochemistry (U)

194 9:00 am VV
A Highly Stereoselective Synthesis of Lagunamide A: A Metabolite from the Lyngbya Majuscula Cyanobacterium Possessing Powerful Anti-Cancer Properties
Jared Stillman, Biology (U)

Session A-17

Poster Education 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

195 9:00 am WW
Examining the Association Between Feedback Specificity and Student Teacher Performance
Mae Tanmajo, Psychology (U)

196 9:00 am XX
Developing Language and Literacy Curriculum
Marina Sanchez, Child and Family Development (U)

197 9:00 am YY
Supplemental Instruction (SI): The Relationship Between First Exam Date, SI Attendance, and Grades for Introductory Courses
Olivia Musil, Interdisciplinary Studies (U)

198 9:00 am ZZ
Analysis of Supplemental Instruction Retention Rates Following Students from Introductory to General Chemistry
Ryan Colelli, Economics (U)

199 9:00 am AAA
Using a Self-Implemented Premack Principle Model to Increase On-Task Behavior in 9th Grade Males with Attention Deficits: A Single Case Design
Jennifer Dowlan, School Psychology (M)

200 9:00 am BBB
Is there a relationship between preschool attendance and enrollment in advanced placement classes?
Ella Holton-McCoy, Liberal Studies (U)

Friday, March 1, 2019
Session B: Poster Presentations

Session B-9

Poster Engineering and Computer Sciences 3
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

248 10:45 am A
All Metal Heat Sink Dual Linear Polarized Phased Array Antenna for Ku-Band Applications
Rudraishwarya Banerjee, computational science (D)

249 10:45 am B
3D Printed Magneto Electric Antenna for Sub - 6Ghz Band
Connor Laffey, Electrical engineering (U)

250 10:45 am C
3D Printed Axial Corrugated Ka-band Feed Horn
Ila Agnihotri, Electrical Engineering (D)

251 10:45 am D
A Thermal-Noise Canceling Low Noise Amplifier using a Cascode Structure for 5G (n79) New Radio
Omar Flores, Electrical Engineering (M)

252 10:45 am E
A Comparative Study of Waveguide based Polarizers at 5G Millimeter Wave Bands
Philip Nguyen, Electrical Engineering (U)

253 10:45 am F
Robust low noise sensitivity of PIV-based pressure measurement by omnidirectional integration
Jose Moreto, Engineering Science (D)

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Session B-10

Poster Engineering and Computer Sciences 4
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

254 10:45 am G
Low-Power Bluetooth Motion Sensor for Spinal Kinematics
Austin Wolf, Electrical Engineering (M)

255 10:45 am I
Developing a Vision-based Intersection Safety Monitoring System for Vulnerable Road Users
Shenchao Zhang, Computer Science (M)

256 10:45 am J
What Safety Surrogate Measures Can be Utilized to Proactively Evaluate Pedestrian and Bicyclist Safety at Signalized Intersections?
Anagha Katthe, Civil, Construction and Environmental Engineering (M)

257 10:45 am K
Where are High-Risk Intersections for Walking and Bicycling in the City of San Diego?
Mahdie Hasani, Civil Engineering/ Transportation Engineering (M)

258 10:45 am L
Flow Visualization of Patient-Specific Right Heart Models in a Mock Circulatory Loop
Jacob Steiner, Bioengineering (M)

259 10:45 am M
A wearable respiration monitor based on the giant magneto-resistive effect
Shane Witsell, Electrical Engineering (U)

Session B-11

Poster Physical and Mathematical Sciences 6
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

260 10:45 am N
Characterization of PHMB as a dynamic capillary coating for fused silica capillaries
Jessica Torres, Chemistry (M)

261 10:45 am O
Improving the Response of Solar Cells to Infrared Light by Attaching Silver Nanoparticles
Debra Harris, Chemistry (U)

262 10:45 am P
Dual Protection Layer Strategy to Increase Photoelectrode-Catalyst Interfacial Stability: A Case Study on Black Silicon Photoelectrodes
Michael Fairchild, chemistry (U)

263 10:45 am Q
Fine-Controlling Morphology of Nanostructured Silicon Interfaces Using Magnetic Nanoparticles for Photoelectrochemical Water Splitting
Margaret Patrick, Chemistry (M)

264 10:45 am R
Catalytic Regeneration of NADH from NAD+ for Enzymatic Consumption!
Nicholas Williams, Chemistry (D)

265 10:45 am S
Organic Solvent Induced Modification of Black Silicon Structures
Waltteri Vakki, Chemistry (U)

Session B-12

Poster Physical and Mathematical Sciences 7
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

266 10:45 am T
Kinase Inhibition Using Atropisomerism
Ramsey Hazin, Chemistry - Biochemistry - BS (U)

267 10:45 am U
Enantioselective Synthesis of Pyridines and Quinolines Atropisomers via Nucleophilic Aromatic Substitution
Andrea Sanchez, Chemistry (U)

268 10:45 am V
Mechanistic Studies of Lewis Base Catalyst-Controlled Regioselective Chlorination of Arenes and Heterocycles
Lalena Janke, Chemistry (U)

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269 10:45 am W
Intersection of Genotype and Phenotype: Informing Predictive Models
Rebecca de Wardt, Cellular - Molecular Biology (M)

270 10:45 am X
The bHLH protein E47 regulates cancer stem cell markers in Pancreatic Cancer
Alejandra Contreras, Cellular - Molecular Biology (U)

271 10:45 am Y
Coral Stem Cells: Measuring epigenetic signatures in diverse cell populations to identify possible stem cells in Scleractinian coral
Kevin Green, Cellular - Molecular Biology (M)

Session B-13

Poster Behavior and Social Sciences 8
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

272 10:45 am Z
School-based Grief Groups can Improve Child Grief Symptoms
Hannah Zimmerman, Child Development (M)

273 10:45 am AA
Parenting, Play, and the Negotiation of Identities
Jezyle Deo Diez, Communication (U)

274 10:45 am BB
Examining the Link between Maternal Victimization and Child Behavior Problems: Through the Lens of Developmental Cascade Model
Jacqueline Duong, Psychology (M)

275 10:45 am CC
Quality of Engagement in Spanish- and English-Speaking Parent-Child Dyads During Free Play
Anele Villanueva, Child and Family Development (U)

276 10:45 am DD
The Effects of Genetic Condition and Ease of Conception on the Perceived Likelihood of Hiring a Health Care Advocate for a Child
Julia Stal, Psychology (U)

277 10:45 am EE
Grammaticality in English-Spanish Preschool-Aged Children
Alicia Escobedo, Language and Communicative Disorders - JDP (D)

Session B-14

Poster Behavior and Social Sciences 9
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

278 10:45 am FF
Examining the nature of spelling errors in deaf and hearing readers using an English spelling production task
Andrea Manriquez, Psychology (U)

279 10:45 am GG
Word Processing Efficiency among deaf and hearing readers
Priscilla Martinez, Psychology (U)

280 10:45 am HH
Bilingual Language Processing: An ERP Study of Cognate Status
Yazmin Medina Alcantar, Psychology (U)

281 10:45 am II
Politeness markers on meanings: Rational Speech Act approach to Korean honorifics
Hagyeong Shin, Linguistics (M)

282 10:45 am JJ
Investigating the use of a syllable discrimination task to study word retrieval in stroke-induced aphasia
Veronica Kneram, Speech, Language, and Hearing Sciences (U)

283 10:45 am KK
Tracking the time-course of visual word recognition using different types of word-like stimuli: An ERP study
Polina Krom, Psychology (U)

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Session B-15

Poster Education 3
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

284 10:45 am LL
Does language shape how students understand the equal sign?
Kevin Pelaez, Mathematics and Science Education (D)

285 10:45 am MM
Cheat Sheets as a Tool to Support the Individualization of ASD Services in Group Settings: A Pilot Study
Brittney Ventenilla, Special Education with an emphasis in Autism (M)

286 10:45 am NN
Getting Ready for School: Language Performance in Young Bilinguals
Julia Moluf, Speech, Language and Hearing Sciences (U)

287 10:45 am OO
Comparing the Roles of Leadership and School Staff in the Implementation of EBPs for ASD in Schools
Kate Hart, Psychology (U)

288 10:45 am PP
Barriers to Cervical Cancer Screening in the Somali Community
Saadia Ali, Psychology (U)

289 10:45 am QQ
One Teacher, Many Voices: The Impact of a Dialogic Stance for Pedagogical Practice with Emergent Bilingual 5th Grade Students
Al Schleicher, Education (D)

Session B-16

Poster Interdisciplinary 5
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

290 10:45 am RR
Assessing the suitability of human-modified forest as habitat for the Endangered moor macaque monkey (Macaca maura) in Sulawesi, Indonesia
Nancy Guzman, Anthropology (U)

291 10:45 am SS
Talking and Listening Healing Circles
Aurora Valdez, Critical Studies of Theater Television and FIlm (U)

292 10:45 am TT
Brightside Produce Store Characteristics and Owner Perceptions
Mariangella Castrejon, Psychology with an emphasis in Industrial Organizational Psychology (U)

293 10:45 am UU
SDSU West Proposal
Tai Disla, Urbran Studies (U)

294 10:45 am VV
Review and qualitative analysis of trans and gender nonconforming experiences within eating disorders treatment
Ethan Lopez, Lesbian Gay Bisexual Transgender and Queer Studies (U)

295 10:45 am WW
Relational Identity and the Bonding of Consciousness
Brian Archibald, Philosophy (M)

296 10:45 am XX
Examining Labor Policies for Women Farmworkers in Chile
Juliana Huaroc, Latin American Studies/Public Administration (M)

Session B-17

Poster Health and Nutrition & Clinical Sciences 4
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

297 10:45 am YY
Functional Movement Performance in Future Healthcare Professionals. Do students possess what they promote?
Ryan Breneman, Kinesiology - Physical Therapy (U)

298 10:45 am ZZ
Posterior chain muscle performance during isolated knee flexion using isokinetic dynamometry versus the nordbord nordic hamstring exercise
Joseph Cuellar, Kinesiology: Applied Movement Science (M)

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299 10:45 am AAA
Sensory Weighting of Postural Control:Implications for Fall Risk in Huntington's Disease
Makenna May, Foods and Nutrition (U)

300 10:45 am BBB
Hypoxia is not reliably prevented by setting a 60 second apnea limit during exercise : the failure of the "one minute rule" for free diving
Nader Mehregani, Kinesiology (U)

301 10:45 am CCC
Neuromuscular Comparisons of the Vastus Medialis in Young and Elderly Subjects during Isometric Contraction
Lam Bui, Kinesiolgy Pre-Physical Therapy (U)

Friday, March 1, 2019
Session C: Poster Presentations

Session C-9

Poster Behavior and Social Sciences 12
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

350 12:30 pm A
Navigating Cancer Care: Causal Beliefs and Treatment Choices at the US-Mexico Border
Mariela Rodriguez, Psychology (U)

351 12:30 pm B
Building Bridges: Inter-racial Dynamics of Organizers of Color
Joshua Hudson, Sociology (M)

352 12:30 pm C
Recent Alcohol Consumption and Treatment Adherence Among Binational HIV-Positive Latinos in the U.S-Mexico Border Region
Nafisa Ferdous, Interdisciplinary Research on Substance Use (D)

353 12:30 pm D
The Socialization of Resilience in Internally Displaced Persons Resettlements in Georgia
Tiana Hodzic, Psychology and Women's Studies (U)

354 12:30 pm E
Female Migration from Paraguay to Argentina
Stefanie Trompeter Rolon, Public Administration and Latin American Studies (M)

Session C-10

Poster Behavior and Social Sciences 13
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

355 12:30 pm F
Evaluation of Dating Abuse Resource Knowledge at SDSU
Gwenyth Crise, Public Health (U)

356 12:30 pm G
The Impact of Sexual Harassment on Job Performance Evaluations
Christina Lee, Industrial-Organizational Psychology (U)

357 12:30 pm I
Effects of Gender-Role Violations, Sexual Orientation, and Race on Performance Evaluations of Male Targets
Adoril Oshana, Psychology: Industrial and Organizational Psychology (U)

358 12:30 pm J
Stigma as a Barrier to PrEP Initiation and Adherence among Young Latino Men who Have Sex with Men: A Qualitative Study
Nicholas Lucido, Public Health (U)

359 12:30 pm K
Implicit Racial Bias in Undergraduate Nursing Students
Karlye Petersen, MSN (M)

360 12:30 pm L
Implicit interethnic biases are not all the same: Examining their validity at the context-level
Hannah Regal, Psychology (U)

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Session C-11

Poster Behavior and Social Sciences 14
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

361 12:30 pm M
Correlation between Gender and Mental Illness
Jacquelynn Nguyen, Sociology (U)

362 12:30 pm N
Preliminary ERP evidence for different rapid feedforward orthographic and phonological masked-priming effects
Hana Zimman, Psychology (U)

363 12:30 pm O
Identifying Tones and Sources in Hypothetical News Articles About ECS
Ranisha Hernandez, Communication (U)

364 12:30 pm P
Medical Ethnobotany and Reproductive Modulation
Crystal Kopels, Anthropology (U)

365 12:30 pm Q
A Climatological Assessment of Burned Areas in South America
Zackary Werner, Geography (M)

366 12:30 pm R
Persistence of medicinal plant knowledge in the communities of Huanchaco and Huanchaquito, Peru
Francisco Hernandez, Microbiology (U)

Session C-12

Poster Engineering and Computer Sciences 6
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

367 12:30 pm S
Fine-Controlling Morphology of Nanostructured Silicon Interfaces Using Magnetic Nanoparticles for Photoelectrochemical Water Splitting
Margaret Patrick, Chemistry (M)

368 12:30 pm T
Fluorescent Compounds Retained by Ultrafiltration Membranes For Water Reuse
Anita Sanchez, Environmental Engineering (U)

369 12:30 pm U
Camino del Rio Drainage Channel Revisions
Jeremy Monroe, Environmental Engineering (U)

370 12:30 pm V
Water Table Experiment: Investigation of the interaction of a hydraulic jump and a cloud of particles
Devin Burke, Aerospace Engineering (U)

371 12:30 pm W
Murphy Canyon Water Solution
Nicholas Steffenino, Civil Engineering (U)

372 12:30 pm X
Flood Capacity Improvement of Sorrento Creek Using HEC-RAS 2D
Wynneth Requieron, Civil Engineering (M)

Session C-13

Poster Physical and Mathematical Sciences 8
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

373 12:30 pm Y
Synthesis of a Brighter New Nucleoside Analogue: Tricyclic Carbon Cytidine
Mackenzie Wyllie, Biochemistry (U)

374 12:30 pm Z
A Nucleoside Analogue with Solvatochromic Absorption for Sequence DNA/RNA Sequence Discrimination
Slrazema Islas, Chemistry with an emphasis in Biochemistry (U)

375 12:30 pm AA
Design and synthesis of new fluorescent thymidine analogues
Ana Shalamberidze, Chemistry (U)

376 12:30 pm BB
Comparison of Redox-Dependent H-Bonding in Simple, Electroactive Ureas Containing Either Ferrocene or Phenylenediamine Redox Couples – Similar Results with Different Mechanisms
Ahmed Elashmawy, Biochemistry (U)

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377 12:30 pm CC
The Role of H-Bonding in PCET: The Chemically Reversible One Electron, Three Acid Reduction of N-Methyl-4,4'-Bipyridine Radical in Acetonitrile
Ksenia Pavlova, Chemistry (U)

378 12:30 pm DD
The Electronics of DNA: Nucleoside Oxidation Potentials Determined via Fast Scan Cyclic Voltammetry
Kyle Logan, Chemistry (U)

Session C-14

Poster Biological and Agricultural 2
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

379 12:30 pm EE
A New Therapy for Melanoma: VAX014 Recruits Immune Cells to Tumors
Kinsey Nelson, Biology (U)

380 12:30 pm FF
CD11b+/c+ immune cell dynamics after treatment of B16F10 melanoma with VAX014
Maria Insa Prat, Biology (U)

381 12:30 pm GG
Regulation of C1 Utilization
Safa Ismail, cellular molecular biology (M)

382 12:30 pm HH
Iron reduction by Methylotuvimicrobium alcaliphilum 20ZR, a model methanotrophic bacterium
Irania Rivera, Microbiology (U)

383 12:30 pm II
Redefining the Transcriptome of the Human Spermatogonial Stem Cell
Merlin Thompson, Cell biology (M)

384 12:30 pm JJ
Characterization of CRISPR-Mouse Model of Autism Spectrum Disorders
Jessica Gutierrez, Biology (U)

Session C-15

Poster Biological and Agricultural 3
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

385 12:30 pm KK
Modeling preeclampsia using induced pluripotent stem cells
Ojeni Touma, Biology (U)

386 12:30 pm LL
Role of Gα12, and Tissue Factor, in the in vitro growth of Human Glioma Stem Cells
Jacqueline Lara, Microbiology (M)

387 12:30 pm MM
Physiological defects associated with expression of myosin dilated cardiomyopathy mutations in a Drosophila model
Yusur Alqaraghuli, microbiology (U)

388 12:30 pm NN
The Role of Adipokines in Mediating Chemoresistance in Ovarian Cancer
Valeria Ochoa, Public Health (U)

389 12:30 pm OO
Feeling the Heat: Direct measurements of microbial metabolic shifts pre-empting the rise of pathogens
Brandie White, Cell and Molecular Biology (D)

390 12:30 pm PP
Drug Combinations to Modify Pancreatic Cancer Stemness
Gregory Burkeen, Cell and Molecular Biology (M)

Session C-16

Poster Biological and Agricultural 4
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

391 12:30 pm QQ
Comparative Analysis of Arabidopsis and Boechera Abiotic Stress Tolerance
Ruth Epstein, Biology (U)

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392 12:30 pm RR
Pigment protein pathways in colorful Habronattus jumping spiders
Karina Silvestre, Biochemistry (U)

393 12:30 pm SS
Taxonomy of the Cryptantha clevelandii complex (Boraginaceae)
Claire Abbott, Biology - Evolution and Systematics, Pre-Medicine (U)

394 12:30 pm TT
Programmed Cell Death in Cylindropuntia wolfii (Cactaceae) Development
Hao Duong, Biology (U)

395 12:30 pm UU
The role of protein kinase c in Hydroides elegans metamorphosis
Milagros Esmerode, Cellular and Molecular Biology (U)

396 12:30 pm VV
Conserved properties of capsids in double stranded DNA viral lineages
Malida Hecht, Physics (U)

Session C-17

Poster Biological and Agricultural 5
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

397 12:30 pm WW
Identification of Core Microbiome and Functional Metabolites of Captive Sharks for Health Matrix Construction
Asha Goodman, Molecular and Cellular Biology (D)

398 12:30 pm XX
Skin Microbiome Taxonomy and Functional Composition of Whale Sharks (Rhincodon typus)
Abigail Turnlund, Biology (U)

399 12:30 pm YY
Distinct Microstructure of the Dermal Denticles of Three Californian Shark Species
Isabel Moreno, Biology (U)

400 12:30 pm ZZ
A Metagenomic Look at the North City Water Reclamation Plant
María Fernanda Mora, Biology (U)

401 12:30 pm AAA
Biological Survey of Chondrichthyes in La Jolla Shores, California Using Environmental DNA
Anissa Busch, Environmental Sciences (U)

402 12:30 pm BBB
Scanning Electron Imaging of Daple Mutant Zebrafish Ependymal Cells
Veronica Vazquez, Biology (U)

Friday, March 1, 2019
Session D: Poster Presentations

Session D-9

Poster Engineering and Computer Sciences 7
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

437 2:15 pm A
Automated Cruise Control
Anthony Savitt, Computer Engineering (U)

438 2:15 pm B
Single Barrier Discharge Plasma Actuators as a Form of Roll control and Drag Reduction
Levi Schlapfer, Aerospace Engineering (U)

439 2:15 pm C
Increasing the Lifetime of Piezoelectric Diaphragms within Synthetic Jet Actuators
Jennifer Martin-Velazquez, Aerospace Engineering (U)

440 2:15 pm D
Unmanned Aerial Systems: Nonlinear High-Fidelity Aeroelastic Analysis
Enrico Santarpia, Engineering Science (D)

441 2:15 pm E
Frequency based determination of small-strain constrained modulus in crushing sands
David Riley, Civil Engineering : Geotechnical (M)

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442 2:15 pm F
Roller Coaster Dynamics
Angelina Forzisi, Mechanical Engineering (U)

Session D-10

Poster Biological and Agricultural 6
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

443 2:15 pm G
Identifying Alphaproteobacteria Genes Necessary for Animal Metamorphosis
Alexandra Strom, Biology (U)

444 2:15 pm I
Animal Metamorphosis-inducing Potential of the marine Gammaproteobacterium, Pseudoalteromonas luteoviolacea
Amanda Alker, Cell and Molecular Biology (D)

445 2:15 pm J
From egg to adult depending on microbes: Interrogation of Hydractinia metamorphosis in response to marine bacteria.
Nathalie Delherbe, Joint Doctoral Program in Cell and Molecular Biology (D)

446 2:15 pm K
NineTeen Complex member, prp19, is essential for stem cell regulation in planarian flatworms
Madison Balagtas, Cellular and Molecular Biology (U)

447 2:15 pm L
PyFBA: Modeling Metabolomics from Genomics
Shane Levi, Bioinformatics and Medical Informatics (M)

448 2:15 pm M
Machine learning method for identifying source environment of meta-genomes
Jillian Burke, Bioinformatics (M)

Session D-11

Poster Biological and Agricultural 7
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

449 2:15 pm N
Understanding the mechanism of allosteric inhibitors on a wide spectrum of IDH1 mutants
Diego Avellaneda Matteo, Biochemistry (D)

450 2:15 pm O
Modulating the reversible MDH1 catalytic reaction in squamous non-small cell lung cancer
Joi Weeks, Cell and Molecular Biology (D)

451 2:15 pm P
Catalytic characterization of mutant isocitrate dehydrogenase 1
Giovanni Quichocho, Chemistry: Biochemistry (U)

452 2:15 pm Q
Optimization of heterologous malate dehydrogenase 1 expression and purification
Ngoc H. Huynh, Chemistry (M)

453 2:15 pm R
Noninvasive Kinetic Monitoring of Response to Targeted Therapy using Circulating Tumor DNA in Non-Small Cell Lung Cancer Patients
Setareh Akhavan, Public Health (U)

454 2:15 pm S
Investigating Super Enhancer MICAL2's Potential Role In Pancreatic Cancer Oncogenesis
Julia Escobedo, Biology (General) (U)

Session D-12

Poster Biological and Agricultural 8
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

455 2:15 pm T
The bHLH factor E47 downregulate oncogenic c-MYC in pancreatic cancer through epigenetic modifications
Xiuyuan Cheng, Biology (U)

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

456 2:15 pm U
Expression and purification of the Drosophila melanogaster (Dm) IKKß:y complex
Samantha Cohen, Chemistry (D)

457 2:15 pm V
Synthesis of Chiral Sulfoxides and Separation of Enantiomers by HPLC method
Sopiko Maglakelidze, Chemistry/Biochemistry (U)

458 2:15 pm W
Structural basis of 7-deazaguanine modification of DNA in bacteria and phage
Eric Hellie, Chemistry (U)

459 2:15 pm X
Inhibition of Neisseria gonorrhoeae GTP cyclohydrolase type IB
Ryan Murphy, Cellular and Molecular Biology (U)

460 2:15 pm Y
Overexpression, Purification and Crystallization of the Queuine Salvage Protein DUF2419
Kevin Zarghan, Cellular and Molecular Biology (U)

Session D-13

Poster Biological and Agricultural 9
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

461 2:15 pm Z
Bacteriahemerythin (BHr) function in Methyltuviomicrobium alcaliphilum (20ZR)
Monica Bermudez, Biology (U)

462 2:15 pm AA
Understanding the Effects of Vessel Mooring Disturbance on Rhodolith Photosynthetic Production
Dillon Dolinar, Biology (Emphasis Zoology) (U)

463 2:15 pm BB
Through the Looking Glass into the Catalina Island Rhodolith Infaunal Microcommunities
Natalie Goetz, Marine Biology (U)

464 2:15 pm CC
Determining the presence of phage-encoded diphtheria toxin gene in the environment
Thelmalyn Montenegro, Biology (U)

465 2:15 pm DD
Presence of Phage-encoded ctx Exotoxin Gene in Aquatic Samples Collected off the San Diego, CA Coastline During an El Nino Event
Tiana Silver, Microbiology (U)

466 2:15 pm EE
Optimizing the efficacy of pulsed 450 nm light on bacteria through correlation with fluorescence spectroscopy
Paulina Cortez, Biology (U)

467 2:15 pm FF
Comparing effects of payments for ecosystem services programs on species richness over time and space
Alexandra Yost, Geography (M)

Session D-14

Poster Physical and Mathematical Sciences 10
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

468 2:15 pm GG
Reactivity of Imidazole Substituted Biaryl Mono-Phosphine Complexes
Hanne Henriksen, Chemistry (U)

469 2:15 pm HH
Toward (Z)-Alkene Isomerization
Esteban Delgado, Chemistry (U)

470 2:15 pm II
Silicon Quantum Dots: A General Photocatalyst for Activation of Tertiary Amine
Yue Sun, Chemistry (M)

471 2:15 pm JJ
Lead-halide Perovskite Nanocrystals as Efficient Photocatalysts for Pyrazoles and Pyrroles Synthesis
Yixiong Lin, Chemistry (D)

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

472 2:15 pm KK
Laser Photochemistry of Hydrocarbon Free Radicals
Karan Doppalapudi, Chemistry (U)

Session D-15

Poster Behavior and Social Sciences 16
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

473 2:15 pm LL
Lessons Learned from an Interprofessional Collaboration: Examining Parent Child Interactions During Shopping
Isabella Bareiss, Speech Language and Hearing Sciences (M)

474 2:15 pm MM
Word Learning Strategies in Children With and Without Language Disorder
Ariana Arakelian, Speech Language and Hearing Sciences (U)

475 2:15 pm NN
White matter pathways supporting speech monitoring after stroke
Alyssa Zidek, Speech Language and Hearing Sciences (U)

476 2:15 pm OO
Lexical Quality Variables in Deaf and Hearing Populations
Madison Trussell, Speech Language Hearing Science (U)

477 2:15 pm PP
Slow Speech Movements in People With Parkinson's Disease With and Without Deep Brain Stimulation
Cassidy Childers-Reid, Speech, Language, and Hearing Sciences (U)

478 2:15 pm QQ
Interindividual variability in the brain dynamics associated with word retrieval as revealed by intracranial electroencephalography
Tiffany Duffy, Speech Language and Hearing Science (U)

Session D-16

Poster Behavior and Social Sciences 17
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

479 2:15 pm RR
Clinical Comparisons of Men Diagnosed with Body Dysmorphic Disorder vs Muscle Dysmorphia
William Grunewald, Psychology (M)

480 2:15 pm SS
Stigma Surrounding Men with Bulimia Nervosa
Josh Lowe, Psychology (U)

481 2:15 pm TT
Symptom severity and associative stigma towards parents of children with disorders
Kiana Wiley, Psychology (U)

482 2:15 pm UU
Nuances in the quantity, quality, and health-relevance of lesbians' social networks
Kelsey Bajet, Psychology (M)

483 2:15 pm VV
Relationship Quality, Health Behaviors, and Mental Health of Lesbian Women in Romantic Relationships
Chandler Spahr, Psychology (M)

484 2:15 pm WW
Latinx Transgender Mental Health: Needs of an Underserved Population
Jocelyne Sandoval, Psychology (U)

Session D-17

Poster Interdisciplinary 12
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

485 2:15 pm XX
Exploring Oral Cancer Knowledge among Mexican-origin Adults
Isaiah Taylor, Kinesiology (U)

486 2:15 pm YY
Low Adherence to and Poor Efficacy of Chemotherapy among African American/Black Women with Breast Cancer
Isaiah Jones, Psychology (U)

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487 2:15 pm ZZ
Patient Barriers to Obtaining Breast Cancer Survivorship Care in Primary Care Settings
Dalia Shantel Valencia, Psychology (U)

488 2:15 pm AAA
Primary Care Providers' Barriers to Providing Breast Cancer Survivorship Care
Rosa Buenrostro, Psychology (U)

489 2:15 pm BBB
The Co-existence of Causal Beliefs about Cancer at the US-Mexico Border
John Moreno, Psychology (U)

490 2:15 pm CCC
Advance Care Planning among Rural Cancer Patients and Its Associated Factors
Nayeli Gonzalez, Social Work (M)

Friday, March 1, 2019
Session E: Poster Presentations

Session E-1

Poster Physical and Mathematical Sciences 11
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

491 4:00 pm A
Geochemical Identification of Sediment Production Hotspots in a Semi-Arid Urbanizing Watershed
Garrett McGurk, MS Watershed Science (M)

492 4:00 pm B
Enantiomer Migration Order Reversal of Tetrahydrozoline in Capillary Electrophoresis
Tamar Basiashvili, Chemistry emphasis in Biochemistry (U)

493 4:00 pm C
The use of capillary electrophoresis techniques in detecting the glycosylation of hemoglobin to determine blood doping
Madison Noroña, Chemistry (U)

494 4:00 pm D
Electrochemically-Controlled Dimerization in Ferrocene Ureidopyrimidone Derivatives. the Effect of Ferrocene Position
Veronika Mikhaylova, Chemistry with emphasis in biochemistry (U)

495 4:00 pm E
Study of Toxicity of Cadmium and Zinc Ions Using Vegetative Test Systems (on the example of Lemna minor L.)
Asmat Kontselidze, Chemistry/Biochemistry (U)

496 4:00 pm F
The Effects of Legislation and Water Management in the Imperial Irrigation District
Nadine Barham, Environmental Science (U)

Session E-2

Poster Physical and Mathematical Sciences 12
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

497 4:00 pm G
Proton Neutron Interacting Shell Model: Order of Magnitude Reduction of Basis Dimension for Medium Mass Nuclei
Oliver Gorton, Computational Science (D)

498 4:00 pm I
Asymptotic Elasticity of Affine Semigroup Elements
Jackson Autry, Master of Arts in Mathematics (M)

499 4:00 pm J
The Discovery of a Transiting Circumbinary Planet in KOI-3152
Quentin Socia, Astronomy (M)

500 4:00 pm K
Discovery of an Unusual Eclipsing Binary Star from Kepler Data
Tiffany Shumack, Astronomy (U)

501 4:00 pm L
The Apsidal Motion Constants in the Triple Star System KOI-126
Mitchell Yenawine, Astronomy (M)

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Session E-3

Poster Engineering and Computer Sciences 8
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

502 4:00 pm M
Soft Real-Time Process Re-Prioritizer
Riker Quintana, Computer Engineering (U)

503 4:00 pm N
Intravenous Therapy Roller Clamp
Frances Lagarda, Bioengineering Biomaterials (M)

504 4:00 pm O
A Computational Model for 3D Collective Cell Migration Guided by Stochastically Generated ECM
Tyler Collins, Bioengineering (M)

505 4:00 pm P
Analyzing Embedded System Security
Kevin Belew, Computer Engineering (U)

506 4:00 pm Q
Smartphone Based Gesture Recognition
Shota Amashukeli, Computer Engineering (U)

Session E-4

Poster Engineering and Computer Sciences 9
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

507 4:00 pm R
Utilization of a Non-targeted Approach to Develop a Comprehensive Array of Persistent Pollutants in Reclaimed Wastewater
Lauren Steinberg, Environmental Engineering (M)

508 4:00 pm S
Mapping Potential Contamination Sources in the San Diego River Watershed
NAlyssa Jaramillo, Civil Engineering (U)

509 4:00 pm T
Soil moisture and hydraulic conductivity patterns in Alvarado Creek, San Diego
Quinn Walker, Environmental Engineering (M)

510 4:00 pm U
T7 Coliphage Decay Rates After Repeated Exposures to Sodium Hypochlorite
Fei Zhao, Environmental Engineering (M)

511 4:00 pm V
Predicting Pathogen Flows through Sanitation Systems: Knowledge to Practice Using the Global Water Pathogens Project
Isaac Musaazi, Environmental Engineering (M)

512 4:00 pm W
Metagenomic Study of Wastewater and Advanced Water Treatment Systems for Indirect Potable Reuse: Insights for Engineering
Arnold Wong, Environmental Engineering (M)

Session E-5

Poster Biological and Agricultural 10
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

513 4:00 pm X
The Effect of Hyperinsulinemia on Tumor Cell Growth
Bayan Almasri, Microbiology with Clinical Lab Science emphasis (U)

514 4:00 pm Y
Discovering the role of long non-coding RNAs during pancreatic differentiation of human embryonic stem cells using dCas9 technology.
Shania Westmoreland, Biology (U)

515 4:00 pm Z
Developing a cell-based assay to monitor proteolysis of the Chikungunya virus capsid to facilitate the discovery of potential antivirals
Alex Escobar, Cellular and Molecular Biology (M)

516 4:00 pm AA
A Bioinformatics Approach for Dengue and Zika Virus Substrate Discovery
Majid Salami, Bioinformatics (M)

517 4:00 pm BB
Coupling of two cell-based screens to reveal potential antivirals against Dengue virus
Danielle Slemons, Cell and Molecular Biology (M)

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518 4:00 pm CC
Development of a Platform that Monitors Cleavage During Transport to and at the Cell Surface
Francesca Ventola, Cellular and Molecular Biology (M)

Session E-6

Poster Health and Nutrition & Clinical Sciences 6
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

519 4:00 pm DD
Depression and Stomach Acid Load
Patrick Montine, Epidemiology (M)

520 4:00 pm EE
Red meat and Inflammation and A1c in Breast Cancer Women
Brandon Khuu, Public Health - Epidemiology (M)

521 4:00 pm FF
Association between Dietary Acid Load and Inflammatory Biomarkers in Breast Cancer Patients
Phoebe Seaver, Epidemiology (M)

522 4:00 pm GG
ABO type as a predictor of efficacy in Immunotherapy
Kasim Hakimi, Kinesiology Pre-Physical Therapy, Biology (U)

523 4:00 pm HH
Glycemic Responses to Overground Bionic Ambulation for Spinal Cord Injury
Monique Rashid, Kinesiology emphasis prephysical therapy (U)

524 4:00 pm II
Short Exercise Intervention using Data Acquisition Air Pressure Pillow (DAQ APP): A Pilot Study for CKD Patients
Melissa Ruiz, Public Health (U)

525 4:00 pm JJ
Postural control deficits with Progressive Supranuclear Palsy
Kathleen Dillon, Kinesiology (U)

Session E-7

Poster Behavior and Social Sciences 18
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

526 4:00 pm KK
BMI and Home Food Availability in Food Insecure Rural Latino Children
Petrona Gregorio-Pascual, School of Public Health (D)

527 4:00 pm LL
Measuring Military Mental Health Providers' Comfort and Proficiency in Assessing Suicide: Psychometric Properties of Two Novel Scales
Summer Reames, Master's of Public Health - Epidemiology (M)

528 4:00 pm MM
Factors related to male partner involvement in elimination of mother-to-child transmission of HIV in rural Uganda
Katherine Schmarje, Public Health, Global Health (D)

529 4:00 pm NN
Scope Review of Bear Literature and Popular Press to Address Issues of Racism and Weightism in the Community
Cameron Wadstrom, Public Health (U)

530 4:00 pm OO
The Process of Piloting Youth Participatory Action Research with LGBTQIA+ Youth in Middle and High Schools
Fitri Wijaya, Public Health (M)

531 4:00 pm PP
Thirdhand Smoke and Cancer: Are Children at Risk?
Alejandro Reyes, Interdisciplinary studies: Public Health, Psychology, Communications (U)

Session E-8

Poster Behavior and Social Sciences 19
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

532 4:00 pm QQ
Prenatal THC Exposure Impairs Motor Coordination in Rats
Ivette Gonzalez, Psychology (U)

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533 4:00 pm RR

A Rodent Model of Prenatal Alcohol and THC Vape Exposure

Samirah Hussain, Psychology (M)

534 4:00 pm SS

Developmental Alcohol Exposure and Choline Supplementation Alter Hippocampal Cytokines in Rats

Samuel Deck, Psychology (U)

535 4:00 pm TT

The Effects of Prenatal Alcohol and THC Vapor Inhalation Exposure on Early Motor Development in a Rat Model

Bahar Sabouri, Biology (U)

536 4:00 pm UU

The Effects of Prenatal Alcohol and THC Exposure via E-Cigarette on Working Memory in a Rat Model

Cristina Rodriguez, Psychology (M)

537 4:00 pm VV

Social Network Analysis of Online Social Media Data-based Research on Electronic Cigarettes

Taylor Perry, Marketing (U)

SRS

Abstracts of Presentations

Session A

SAN DIEGO STATE UNIVERSITY

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

Session A-1

Oral Engineering and Computer Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Pride Suite

100 9:00 am

Calculation of 2D Flame Structure for Premixed Axisymmetric Stagnation Flames

Jeremy Brunnenmeyer, Mechanical Engineering (U)

In the current work, steady premixed flames in stagnation flow will be studied in terms of formation and deposition of carbon nanoparticles. Flames will be simulated and compared to a flame reported in a previous study [1]. The objectives are to compare a pseudo 1D solution from OPPDIF against a 2D solution from ANSYS Fluent as well as against experimental results.

The experimental configuration is a uniform laminar jet issuing from a circular nozzle which impinges on a stagnation surface normal to the flow. The series of flames have unburned mixtures containing ethylene, oxygen and argon with equivalence ratio (defined as the fuel to O2 ratio divided by the stoichiometric ratio) of $\phi = 2.5$. These flames were modeled by using a pseudo 1D formulation implemented in the OPPDIF reacting flow code [2]. The previously reported experimental results are in a high-temperature regime that a gas-phase model for ethylene combustion (USC Mech II, [3]) has showed reasonable agreement with. However, soot formation models are known to fail at these elevated flame temperatures, and thus will not be included in the models [4].

The 2D model will capture the flow divergence at the stagnation surface and indirectly give insight into growth of films in the boundary layer. The formation and growth of carbon nanoparticles occurs after the flame in the region containing fuel rich flame products and follow velocity streamlines but are affected by thermophoretic forces near the plate. In addition, comparison of the flame temperature and flame position measured in Bonpua et al. to the proposed 2D flame simulations is of interest [1].

The proposed 2D calculations of the reacting flow will give preliminary insight into the deposition process in terms of the deposition area and boundary layer. Future work will incorporate the formation of particles in the flame, diffusion-driven deposition of nanoparticles in the boundary layer and growth of the porous film on the stagnation surface. The flame structure and flow field will be solved with the known flow rates and fixed temperatures at the nozzle and stagnation surface.

101 9:15 am

Deployable Support Framework for the Mars Base

Beqa Mikadze, Electrical Engineering (U)

When Elon Musk, founder and CEO of SpaceX unveiled his plan to colonize Mars before 2024 (or 2031), the scale and importance of the project became clear to the world. However, there were sets of technical problems associated with the colonization; such as: growing crops on Mars' soil, recycling water and human waste, creating ideal environment for humans to live in, and so on...

Our team of San Diego State University Georgian Campus students, Vakhtang Kontridze and Beqa Mikadze, decided to design a Framework for a base on Mars, that could be used to create a temporal (or even long-lasting) settlements.

We created an elementary component called Clepsydron – a spherical engineering mechanism that can collapse from its opened state to a folded state. In the beginning Clepsydron had several limitations to its customization and unfolding patterns, and had no real-life applications, other than being conceptual. We decided to put it into a direct use.

Since colonization of Mars has rocket restrictions, such as volume and mass of transported cargo, it was important for our Framework of a base to have the following properties:

(a) The transformable elementary components must exist;

(b) The Framework must fit our varying design and measurements;

(c) The Framework must transform into a smaller, folded mechanism;

(d) The Framework must have minimal surface area and maximal volume.

With all these requirements in mind, we were ready to start working. There already were concept ideas of what the base on Mars would look like, but they were merely building designs and one intended by us couldn't be found anywhere on the global market.

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

102 9:30 am

Numerical Model of a Concentrated Solar Power Combined Cycle Plant with Sensible Thermal Energy Storage

Edwin Gonzalez, Mechanical Engineering (M)

Humanity's need to transition from fossil fuel-based power generation to more environmentally friendly renewable sources has contributed to huge progress in solar energy research. Concentrated solar power (CSP) can store large amounts of energy for peak shifting and potentially will operate at higher overall efficiencies than photovoltaics. Amongst the various CSP technologies, power tower systems show the most promise in the long-term when paired with a thermal energy storage system (TES).

A numerical code, modeling a rock-filled TES system, to be used in conjunction with a CSP power tower plant, was developed. This porous media bed storage is being applied from a successful model solving a set of two coupled partial differential equations modeling the temperature of the solid and fluid at various nodes throughout the volume. The goal of this project is to integrate this numerical model of a high-temperature rock bed sensible heat storage system into hybrid solar combined cycle previously developed at the Combustion and Solar Energy Lab.

The strategy explored here is to put the storage unit after the gas turbine in a combined cycle plant, since storage prior to the gas turbine still requires substantial research due to the high temperatures involved. The initial strategy is to have the gas turbine operate while the sun is providing solar input. Using the National Renewable Energy Lab's System Advisor Model, approximations of useful solar input were made. During the daylight operation, the storage will capture the exhaust from the gas turbine through heat transfer from the gas to the rocks inside the storage. Once the solar resource drops to zero at night, ambient air will be blown back up the storage unit, acquiring the heat from the rocks. This heated air then enters a heat recovery steam generator where steam is produced to power the bottoming Rankine cycle.

Temperature profiles for charge and discharge cycles of the storage unit as well as 24-hour operation power results are presented. A comparison between the properties of dry air and a combustion gas is made. The resulting storage profiles of the TES comparing these two inputs are also shown.

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103 9:45 am

Fabrication of Binary Manganese Oxide - Carbon Films by Flame Assisted Deposition with Tuned Metal Oxidation and Carbon sp 2 Bonding

Aleksandr Aleshin, Mechanical Engineering (M)

Binary manganese oxide - carbon films were fabricated by flame-assisted chemical vapor deposition from premixed stagnation flames. Mn oxide and carbon nanoparticles were synthesized by flame synthesis and deposited from two separate burners in a layer by layer manner as the substrate alternated between flames. This fabrication method resulted in mesoporous binary films with controllable particle and film properties. Particle properties include the oxidation state of manganese and extent of sp 2 bonding on the flame-formed carbon. The oxidation state of manganese is readily controlled by the flame equivalence ratio to produce manganese oxide nanoparticle with valence of II, II-III, III and IV. The structure of flame-formed carbon currently produced exhibits sp 2 carbon bonding at levels exceeding that commonly observed in soot. This structure is largely due to the synthesis conditions at flame temperatures at 2150K and above. The film properties are tuned by controlling the particle size and rate of interchange between the separate flame sources. Potential applications of the binary Mn oxide-carbon films in electrochemical energy storage devices will be discussed.

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104 10:00 am

Evolution of sp2 carbon bonding on nanoparticles formed in premixed stagnation flames at elevated temperature and equivalence ratio

Shruthi Dasappa, Mechanical Engineering (D)

Premixed stagnation flames were employed for generation of carbon particles at elevated flame temperature and equivalence ratio. The particle size distribution and the carbon bonds were studied using a particle mobility sizer and Raman spectroscopy. The growth time of the flame was fixed at tp ~ 13ms and the equivalence ratio varied between $\Phi = 2.4$ and $\Phi = 2.6$. The maximum flame temperature increased from $1950K < T_{f,max} < 2250$ K for both equivalence ratio conditions. The PDSF decreased in size and narrowed in width as the flame temperature increased. For the same peak flame temperature, as the equivalence ratio increased the particle size distribution was wider along with increase in particle size. Several features of the Raman spectra were used to analyze carbon bonds on the flame-formed carbon with increasing flame temperature and changing equivalence ratios. A similar evolution from low contribution of sp2 to higher sp2 contributions as the flame temperature increased was observed in Raman spectra of films deposited from both equivalence ratio conditions. As inferred from the inferred from the observed Raman spectra, the effect of equivalence ratio on sp2 bonding for carbon formed at elevated temperature was to shift the transition from amorphous carbon structure to sp2 dominated structure towards higher temperature for higher equivalence ratio. These observations shed light on the evolution of carbon structure for incipient particles formed at elevated temperatures.

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105 10:15 am

Flames in Space: Radiation and Image Analysis

Luca Carmignani, Mechanical and Aerospace Engineering (D)

Two concluded NASA investigations, Smoking Point in Co-flow Experiment (SPICE), and Burning and Suppression of Solids (BASS), are considered in this work to study the role of flame

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radiation in microgravity. These flames, different in nature, were tested onboard the International Space Station (ISS) with the same experimental hardware, and they can be compared. Flame radiation is an important heat transfer mechanism and can determine flame growth or extinction depending on the burning conditions. To ensure a safe environment for astronauts in future space missions it is necessary to better understand flame spread in reduced gravity, where conventional fire safety procedures cannot be applied. Results from SPICE and BASS are already available in literature, but the variation of the radiation signals recorded during the experiments has never been presented. By using image analysis, a connection between flame areas measured from the videos and their radiation signals is investigated. Furthermore, from the high-quality pictures taken during the experiments we isolate and measure different regions of a flame, such as the yellow area (rich of intermediate products from incomplete combustion) and the blue region, which is often not visible due to the lower brightness. A parametric study of radiometer signal and flame area explores the effect of flow velocity, oxygen concentration and fuel nature on the radiation signature of these microgravity flames.

Session A-2

Oral Physical and Mathematical Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Park Boulevard

106 9:00 am

Ultrasensitive Detection of Cancer Biomarker CEA Using Multi-Photon Nonlinear Laser Wave-Mixing Spectroscopy

Taylor Inouye, Chemistry (U)

Nonlinear laser wave-mixing spectroscopy integrated to a capillary electrophoresis system has been demonstrated as a label-free, antibody-free sensitive method for detection of the cancer biomarker carcinoembryonic antigen (CEA). Laser wave mixing provides advantages over current detection methods including zeptomole-level detection and high spatial resolution suitable for single-cell analysis. The wave-mixing signal beam is strong, collimated and coherent, and hence, it can be collected by a photodetector with high optical collection efficiency and an excellent signal-to-noise ratio (S/N). Since CEA absorbs in the UV wavelength range, a 20 mW 266 nm UV solid-state laser can be used to excite the analyte in its natural form without the need for labeling. Or CEA could be tagged using a chromophore or a fluorophore and detected using a more convenient visible laser (blue or green). 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 preliminary CEA detection limit is comparable or better than those of ELISA or fluorescence-based techniques. Wave-mixing identification can be used for both fluorescing (labeled) and non-fluorescing (label-free) samples; it can also be easily adapted to a battery-powered portable detector that is suitable for use in the field. Potential applications include a reliable detection method for numerous biomarkers, cancer cells, single cells, and viruses for early diagnosis of diseases.

Acknowledgment: We acknowledge partial support of this work by the U.S. Dept. of Homeland

Security Science and Technology Directorate, U.S. Dept. of Defense, Army Research Office,

NSF, NIH (R01), and NIH NIGMS IMSD.

107 9:15 am

Sensitive Detection of Pancreatic Cancer Biomarkers Using Microfluidics and Nonlinear Multi-Photon Laser Wave-Mixing Detector

Samantha Crawford, Chemistry (U)

Multi-photon nonlinear laser wave-mixing spectroscopy is presented as a sensitive detection method for pancreatic cancer biomarkers carbohydrate antigen 19-9 (CA 19-9) and carbohydrate antigen 242 (CA 242). Current detection methods require time-consuming and complicated labeling steps. Our patented nonlinear laser wave-mixing methods offersignificant advantages including label-free native detection, excellent sensitivity, small sample requirements, short optical path length, high spatial resolution andportable detector designs. The wave-mixing signalhas a quadratic dependence on analyte concentration, and hence, small changescan be monitoredmore effectively (an ideal sensor). Since wave-mixing probe volume is small (nanoliter to picoliter), it is intrinsically suitable for microfluidics or capillary-based electrophoresis systems. Different biomarkers can be placed on a simple slide or flowed inside a capillary and then detected. Since wave mixing is an absorption-based method, both fluorophore and chromophore labels could be used, if desired. Excellent sensitivity levels for CA 19-9 are demonstrated using a Chromeo P503 tag and a 473 nm solid-state excitation laser. One can run a standard protein ladder to estimate capillary electrophoresis retention time for CA 19-9. The glass slides and microarrays used in these detection methods for early diagnosis of pancreatic cancer arecustomdesigned in our research lab.

Acknowledgment: We acknowledge partial support of this work by the U.S. Dept. of Homeland Security Science and Technology Directorate, U.S. Dept. of Defense, Army Research Office, NSF, NIH (R01) and NIH NIGMS IMSD (2R25GM058906).

108 9:30 am

Oxygen: Cycling and Inracellular Production in Methylotuvimicrobium Alcaliphilum

Snehal Nariya, Microbiology (M)

Methane (CH4) is the second most abundant greenhouse gas. Compared to carbon dioxide, methane is more potent at absorbing radiation and trapping heat into the atmosphere. Significant reduction in atmospheric CH4 levels could have

a rapid impact on lowering global temperatures. Sustainable mitigation of global methane levels can be achieved via microbial methane utilization. Furthermore, methane-based technology has the potential to produce valuable secondary metabolites. However, methane oxidation requires other compounds such as oxygen, sulfur species, nitrogen species or metals to drive the process. The sulfur, nitrogen, and metals are too expensive. Although oxygen is abundant in the environment, pure oxygen is an expensive feedstock for industrial application. Moreover, the use of pure oxygen-methane mixtures is dangerous. Thus, biotechnological applications requires further developments of an efficient system for intracellular oxygen generation and capturing.

Microbes utilize either photosystem complexes or oxygen carrier molecules such as bacteriohemerythrin (Bhr). Scientists have proposed that the function of bacteriohemerythrin in methanotrophic bacteria is to transport oxygen to the particulate methane monooxygenase (pMMO) for methane oxidation. However, the role of Bhr in the context of live bacterial cells remains to be explored. Here, the consequences of the overexpression and deletion on aerobic methane oxidation in Methylotuvimicrobium alcaliphilum (20ZR) were investigated.

Of the three known pathways for biological oxygen production, light-dependent oxygen production (photosynthesis) is the most prominent and well-studied. In this study, we investigated the ability of 20ZR to harness oxygen produce via PSII-mediated water hydrolysis for growth.

109 9:45 am

Synthesis and Photophysical Properties of Modified Nucleic Acid Oligonucleotides with Fluorescent Tricyclic Cytidine

Marc Turner, Chemistry & Biochemistry (D)

Fluorescence-based detection of specific DNA/RNA sequences in biological samples using classic fluorescence in situ hybridization (FISH) has been crucial in optically detecting specific sequences. Common targets may include specific mRNA, genes, or bacterial 16S rRNA. Fluorescent probes can, however, yield false positives by hybridizing to similar sequences that differ little in the thermodynamic stability of the duplex. Probes with our lab's tricyclic cytidine derivatives can potentially discriminate sequences more accurately than current hybridization methods. In our lab's previous work, the tC derivative 8-diethylamino-tC (8-DEA-tC) was shown to have a fluorescence turn-on property. This analogue has a low intrinsic emission of fluorescence (Φem=0.010), however the emission can increase up to 0.12 when 8-DEA-tC pairs with guanosine in duplex DNA. In this current work we measure the photophysical properties of 8-DEA-tC DNA-RNA heteroduplexes, which have larger increases in 8-DEA-tC fluorescence relative to double-stranded DNA. The magnitude of increase depends on the bases flanking 8-DEA-tC with guanosine on the 5' side and cytosine on the 3' side yielding the largest fluorescence increase—the ratio of emission increases from 0.032 as single-stranded DNA to 0.20 in a DNA-RNA heteroduplex. The structure of the duplexes will be measured by circular dichroism spectroscopy to assess if the structures assume A-form DNA like natural DNA-RNA heteroduplexes. 8-DEA-tC may become especially useful for recognizing specific RNA in biological samples given the large increase in fluorescence upon forming DNA-RNA heteroduplexes. We are also developing tC-derived peptide nucleic acids (PNA) as alternative hybridization probes since their modified structure confers higher binding affinities to DNA or RNA targets. We are working on synthesizing Fmoc-protected PNA monomers for parent tC and 8-DEA-tC that can be used to generate PNA oligonucleotides. After solid-phase peptide synthesis, the tC-derived PNA probes will be characterized by fluorescence spectroscopy and circular dichroism to measure their photophysical properties.

110 10:00 am

Leveraging atropisomerism to obtain selective 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. The active sites of these kinases are highly conserved throughout the known 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.

81% of FDA approved 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 interconversion or 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 general strategy to increase kinase selectivity. By rigidifying the biaryl axis through the addition of steric bulk adjacent to the axis of chirality, we found the (Ra)-atropisomer to be more selective and potent towards oncogenic RET kinase than the (Sa)-atropisomer. The initial inhibitor was then optimized through iterative in silico screening, in vitro testing, and structure activity relationship analyses to achieve an 8 nM IC50 RET (Ra)-atropisomer inhibitor. Compared to current clinical RET inhibitors, our compounds were more selective (>400x over VEGFR2 and >1500x over EGFR). The lead compounds also displayed anti-proliferative effects in the 1uM range in 3 different RET-driven cell lines and were inactive to those cancers driven by off-target kinases, showing our selectivity held in cellular assays. Interestingly, during a kinome screen we found our active inhibitor to be a potent towards an oncogenic, resistant kinase EGFR T790M L858R. We validated this activity in cellular models of this kinase leading to highly sought after non-covalent, triple mutant selective EGFR kinase inhibitor. As more compounds are tested, we will iteratively optimize towards RET and EGFR T790M, potentially leading to valuable chemical probes and/or novel therapeutics.

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

111 10:15 am

Applications of VMAR for the construction of Lagunamide A

Monny Singh, Chemistry (D)

Lagunamide A is a natural product originally isolated from Cyanobacteria with an exceptional biological activity showing great promise as a future therapeutic agent. Lagunamide A has many biological activities and exceptional IC50 values. High cytotoxicity is present against P388 murine leukemia cell lines (IC50 6.4-20.5 nano-M) and Ileocecal colon cancer (IC50 1.6 nM). This possible therapeutic has also impressive anti-malarial properties (IC50 0.19-0.91 micro-M). With such noteworthy activities, Lagunamide A shows great promise as a powerful therapeutic agent and brings the need for a short straight forward synthesis to provide enough material for the investigation of biological studies. Current data shows the depsipeptide mode of action having an intrinsic apoptotic pathway by cleavage of capsase-9 which activates a series of cascades resulting in mitochondrial assisted apoptosis. We will present a novel stereocontrolled total synthesis of Lagunamide A. This encompasses a highly convergent asymmetric route which installs 5 of the 10 critical stereocenters integrated heavily along the backbone of the natural product. Four stereocenters are installed with high accuracy using two novel iterative Vinylogous Mukaiyama Aldol Reactions (VMAR). We will present different platforms of VMAR being used for the construction of C27-C45 segment of Lagunamide A. Two types of VMAR's have been investigated for the challenging installation of the C37 stereocenter. The first involves the use of remote asymmetric induction via chiral auxiliaries. The second involves the use of bidentate lewis acids that takes advantage of asymmetric environment provided by the substrate.

Session A-3

Oral Interdisciplinary 1

Friday, March 1, 2019, 9:00 am

Location: Tehuanco

112 9:00 am

California Wildfire Mapping

Austin Westphal, B.S. in Geography with an emphasis in Geographic Information Science (U)

While still an ongoing project, the California Wildfire Mapping project visualizes wildfire data across the state of California over the course of nearly two decades. Data collected from the Geospatial Multi-Agency Coordination, an internet-based mapping application provided by the United States Geological Survey and designed for fire managers, layers wildfire perimeters from the years 2000 to 2018. Charts and graphs developed from wildfire GIS data, in addition to the map layers, can be used to reveal critical trends and draw conclusions on wildfire patterns and movement over time. Prelimary research reveals a general trend in the increase of total area burned in Californa and the United States, although further study is required to analyze wildfire trends and conclude research.

113 9:15 am

Analyzing the Presence, in Humans, of crAssphage: A Highly Abundant Bacteriophage Found Around the Globe

Holly Norman, Microbiology- CLS (U)

CrAssphage is an abundant and ubiquitous virus that is predicted to be present in about half of the human population around the globe based on the analysis of microbiome sequences. Previously, we tested volunteers to determine whether their microbiome contained crAssphage, to monitor the gain and loss of crAssphage, and to understand how it might affect human health. To do this, we extracted DNA from the volunteers' fecal samples and used that as our template for a PCR. These PCR products then underwent gel electrophoresis, and were sequenced. This study revealed that the abundance of crAssphage in fecal samples is dynamic: half of the participants gained or lost crAssphage during the five weeks of this study. For one participant it took several weeks to regain crAssphage, while in others crAsssphage was regained within days. These results suggest that there may have been a limit of detection in the assay that was used. To investigate this, we are re-analyzing the DNA samples using qPCR, and comparing the results to the positive/negative readings we observed on the agarose gels. We will normalize each individual sample to have the same concentration of DNA to ensure comparative accuracy. Ultimately, this will determine the amount of crAssphage that is gained or lost during a specific period of time, and could identify any pre-existing limit of detection on the previous assay.

114 9:30 am

Modeling the Lilac Wildfire Evacuation with Cellular Data

Benjamin Melendez, Civil Engineering (M)

Southern California is prone to wildfire events that spark evacuations of communities in the Urban-Wildland Interface. In December 2017, the Lilac Wildfire ignited in northern San Diego County, forcing 10,000 residents to evacuate.

Highly developed regions, such as Southern California have a number of transportation data sources to draw from that can support emergency managers' decision making processes. Up to date traffic sensors, such as those found on the majority of California's highways, can inform emergency managers on current traffic densities, flows and speeds. Yet, in many wildfire prone regions of the United States, this is not the case. Despite this data shortfall, many regions do have robust cellular networks that inherently produce substantial amounts of location data. The location data produce by cellphone users can be used to predict vehicular densities on evacuation routes.

This thesis will examine how cellular data can be used to predict vehicular densities on evacuation routes. Correction factors were developed to adjust for the overestimation of users on roadways by cellular networks. Extrapolation factors were also developed for estimation of the number of cellular users based on a single cellphone "counts" data point. Finally, a simple equation was developed to aid in the prediction of cell phone densities on evacuation networks.

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

This methodology may prove useful to transportation planners and emergency managers in planning evacuations in areas not served by a network of traffic sensors.

115 9:45 am

Climate Change Impacts on Winegrowing Regions in Southern California: From the Perspective of a Regional Climate Model

Corrie Monteverde, M.Sc. Geography, emphasis Watershed Science (M)

This project will use high-resolution regional climate modeling and observational data to estimate winegrape crop suitability changes for Southern California in the near future and the potential effects of global warming on crop yield. Winegrape represents an economically valuable perennial crop and is very sensitive to changes in temperature. Therefore, determining how climate change can impact crop suitability and potential yield is key.

Results from the Weather Research and Forecasting (WRF) regional model coupled with the Simplified Simple Biosphere (SSiB) land surface model will be used to determine past and future suitability, based on climatic indices relevant to winegrape crop. Model simulations will be completed for two periods: 1983-2012 and 2021-2070. The later period will represent a future with increased greenhouse gas (GHG) concentrations of carbon dioxide, methane, and nitrous oxide based on the Representative Concentration Pathway 8.5 (RCP8.5). Global warming impacts on crop yield will be determined through regression analysis of winegrape yield and long-term changes in temperature and precipitation.

This project will provide high-resolution climate data for Southern California and provide future regional suitability analysis for an economically valuable crop. Additionally, information from climate analyses can be used in vulnerability assessments that can inform decision-making to guarantee local resilience to climate change impacts.

116 10:00 am

Developing a Hydrologic Model to Assess Watershed Sustainability

Jack Mikesell, Civil Engineering - Water Resources Engineering (M)

Water and land resource managers require innovative prediction techniques to help anticipate how anthropogenic and natural disturbances, like climate change, increased urban sprawl, and increased wildfire incidence, affect hydrologic processes at varying spatial and temporal scales. Hydrologic models are key tools applied by engineers to simulate land-atmosphere interactions and inform land managers and urban planners of considerations vital to managing high intensity stormflows and other longer-term alterations to the hydrologic cycle. These models track the path of every drop of rainfall, their effect on the land surface, and pollutants they entrain along the way. This study utilizes a physical-based hydrologic model, the Loading Simulation Program C++ (LSPC), to assess changes to the hydrologic cycle induced by simulated climate change, urbanization, and wildfire scenarios in the San Diego River Watershed. We synthesize an array of land-surface characteristics to develop Hydrologic Response Units (HRUs), 30-meter land classification pixels, as model inputs across the watershed which dictate stormwater and sediment flux as it flows overland and is routed through streams and channels. Each HRU contains a unique combination of four variable classes: hydrologic soil group (a proxy for infiltration capacity), land surface slope, land use, and burn severity. Using a 136-acre catchment in Del Cerro, San Diego, 36-acres of which burned in a brush fire in 2018, we simulate land-surface changes from wildfire by estimating increases in soil scour, soil detachment rate, increased gully erosion, and decreased initial infiltration capacity. Preliminary results show tenfold increases in surface erosion for highest burned land pixels from the fire, a tripling in overall sediment production, and increased streamflow for the 85th percentile regional storm. We use these results to simulate future potential fires within the basin. Estimated results for climate-change and urbanization scenarios are decreased annual water supply to the river basin, increased peak flows observed after higher intensity storms, and a higher delivery ratio of rainfall to the river outlet as climate change and urbanization scenarios intensify. These results inform water managers of expected effects as these disturbances escalate and provide crucial risk mitigation information to urban planners as we move into the future.

117 10:15 am

In the Interest of Time: Influence of rainfall temporal resolution on modeled streamflow and hydrologic metrics in southern Californian watersheds

Kelly Flint, Masters in Civil Engineering with a specialization in Water Resources Engineering (M)

In southern California, habitat alterations induced by changing landscape composition and climate make it increasingly difficult for many native aquatic and riparian species to find food and refuge from predators, successfully reproduce, and contend with invasive species. Hydrologic metrics (e.g. consecutive low-flow days, Richards-Baker index of stream flashiness, and maximum mean monthly streamflow) based on daily streamflow averages are an efficient way to assess habitat suitability and inform watershed management decisions and prioritize at-risk species. Daily streamflow estimates produced by rainfall-runoff models, like the Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS), can be sensitive to rainfall rate, particularly in semi-arid regions with highly variable rainfall intensities. This project uses a 10-year record (2000-2010) of observed data from an extensive network of federally and regionally maintained rainfall and streamflow gages to investigate the influence of rainfall temporal resolution on estimated hydrologic metrics in southern California. HEC-HMS models are calibrated for 25 basins to represent a range of southern Californian landscape and climatic characteristics. Hydrologic metrics derived from daily streamflow estimates produced with hourly and daily rainfall data as model input are compared for each basin and statistically analyzed for sensitivity across climatic and physical conditions.

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118 10:30 am

Understanding groundwater variability: modeling groundwater storage change in southern California

David Rother, Geography (D)

This project details the development, calibration, and application of an atmosphere-land- groundwater model that is used to simulate groundwater storage change in southern California between November 2005 and December 2016. The model consists of three separate components: the Weather Research and Forecasting (WRF) atmospheric model, the Simplified Simple Biosphere (SSiB) model, and a modified version of the Simple Groundwater Model (SIMGM). A full coupling of the WRF/SSiB/SIMGM allows for a complete simulation of the physical and biophysical processes that influence groundwater storage, as well as their interactions with regional climate. The primary dataset used to validate the results of the model is of terrestrial water storage provided by NASA's Gravity Recovery and Climate Experiment (GRACE) satellites. The analysis of in-situ USGS groundwater well water table depth measurements indicate that GRACE adequately represents groundwater storage fluctuations in the region. A series of physics scheme combinations within the WRF model were tested to determine which most accurately simulated patterns of precipitation and temperature during November 2005 - February 2006. Further sensitivity tests were performed on the SSiB/SIMGM model, specifically on the equation representing groundwater discharge. Time series analyses comparing the atmosphere-land-groundwater model and GRACE observational data suggest that the model tends to simulate terrestrial water storage more accurately during wet periods than in dry, however, it underestimated the intensity of the negative groundwater anomaly compared to the offline model. The statistical tests used to evaluate the model's performance, including mean bias and correlation, indicate that the WRF/SSiB/SIMGM coupled model captured precipitation and temperature with good accuracy, however, the model underestimated the drought signal displayed in the GRACE terrestrial water storage dataset. Overestimation of precipitation over Arizona and along California's south-eastern border was the primary cause of excess soil moisture and water storage in these areas.

Session A-4

Oral Humanities, History, Literature, Philosophy 1

Friday, March 1, 2019, 9:00 am

Location: Aztlan

119 9:00 am

Caught Between Two Worlds: The San Francisco Bisexual Center, 1976 - 1985

Benjamin Calabrese, History (U)

Bisexuality has been routinely denied as a legitimate sexual identity by both heterosexuals and homosexuals throughout history, in accordance with the commonly held monosexual dichotomy of sexuality. This denial contributed to the creation of a separate bisexual community on the coasts of the United States in the late 1960s and 1970s. One of the earliest bisexual organizations was opened in San Francisco in 1976. The San Francisco Bisexual Center formed out of a desire of bisexuals to combat stereotypes and misconceptions of them held by the rest of society. My research attempts to tell its story for the first time.

Historian of gender and sexuality studies, Steven Angelides, characterizes bisexuality as being generally ignored and marginalized in the greater historical study of sexuality. This is exactly what the bisexuals of the San Francisco Bisexual Center reacted against in 1976. Particularly, they felt as though the gay and lesbian movement of that time viewed them as 'sell-outs' or as simply being too internally homophobic to come to grips with their 'true' homosexual identity.

My research utilizes the manuscript collection of the San Francisco Bisexual Center, and particularly its newsletter, The Bi-Monthly, which ran for the whole of the Center's existence. Focusing on the Center's newsletter, my research analyzes the internal organization, public activities, and tensions of the San Francisco Bisexual Center. These sources reveal the many roles the center played in the San Francisco area bisexual community for nearly a decade. These roles were as a resource for emotional support, a social club for its members, and as a political action group. These different roles often strained the cohesion of the Bisexual Center, as factionalism emerged within it; this finally tore the Center apart, leading to its collapse in 1985. However, the Center's social and political legacy in creating a bisexual identity and community was significant: it became one of the most influential bisexual organizations both in the San Francisco Bay area and beyond. My research attempts to add its story to the historical narrative.

120 9:15 am

The Fight for Tecolote Canyon and the Women Who Led It: Feminism and Environmental Politics in San Diego, CA 1960s-1970s

Shannon Farnsworth, History and Anthropology (U)

Nestled in between subdivisions just East of Mission Bay lies Tecolote Canyon, a large open space area saved from development during the 1960s and 1970s. Women were the primary figures who recruited like-minded individuals and led the movement to conserve the canyon. Using several primary and secondary sources, including books, journal articles, documents from the San Diego State University Special Collections and University Archives, various city records, the archives in the Tecolote Canyon Nature Center, and oral history from those directly involved, this research examines the role of the women who fought to save Tecolote Canyon in relation to a larger discourse among historians concerning how women have been connected to the environment throughout history.

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121 9:30 am

Collaboratively Geo-Designing SDSU West

Nguyen Tran, Computer Science (U)

San Diego's ballot initiative approved of SDSU's plan to create an SDSU West campus at the Mission Valley stadium site. This is an opportunity for the school to transform the site into an innovative environment that is beneficial to not only members of the campus, but to the public. With the university making public participation a key priority in developing the site plan, we must address the key questions: (1) How should SDSU West be designed to meet future goals of sustainability, livability, and equity? (2) How might we incorporate input from members of the campus and stakeholders through collaboration?

The oral presentation will illustrate how a geo-design process can be conducted to guide the design of SDSU West.

The members of Dr.Appleyard's research team collaborated with Professor Jankowski's Geography class, alongside PhD Student, Chiara Cocco. Before coming together as a group, each individual designed proposals using the geo-survey tool, Geoforage. We collaborated our ideas together using the cloud-based software, Geodesignhub as the design platform. We used The Smart Growth Equity Calculator designed by Dr. Appleyard to explore the 3 key factors (sustainability, livability, and equity) of the area to ensure our designs would be considered. Two maps were developed to evaluate the suitability for re-development for eight territorial systems such as University facilities, housing density, and different infrastructures. Students were divided into six groups to develop various scenarios while staying within the guidelines. The scenarios were based on whether technological advancements were not considered, were considered at a steady pace, or were top priority. We compared the scenarios and each group was asked to select different combinations of proposals to create an alternative through negotiation. In conclusion, University use, mixed use, and transportation were the most important factors for SDSU West as we consider the goals of sustainability, livability, and equity.

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122 9:45 am

The Sacramento Squatters' Riots of 1850

Eric Johnson, History (M)

Boosterism orchestrated by land speculators and city officials combined with unprecedented economic opportunity to draw a massive influx of landless squatters to Sacramento during the California Gold Rush. Tensions and violence ran high between squatters and land speculators, resulting in a full-blown riot that erupted in Sacramento's streets in 1850. Historians have traditionally relied on local newspapers' contemporary accounts to reconstruct and understand these riots, but these sources are far from objective. Wealthy landowners, including John Sutter, Edward Kemble, and John Fowler, extensively influenced and coordinated with affluent newspaper owners during Sacramento's early years; they manipulated the local media's coverage of the 1850 Squatters' Riots and squatter rights to deliberately vilify squatters in the local community. This vilification was part of a collective effort by landowners and city officials to eradicate squatters from Sacramento. Numerous biased portrayals of squatters within the pages of the Placer Times, Sacramento Transcript, and the Daily Alta California offered a one-sided narrative of events surrounding the Squatters' riots in Sacramento. Upper-class ownership of the media in Sacramento depicted squatters as losers of the Squatters' Riot, which cleared the way for land planners to develop the city during its early beginnings without interference from squatters.

Manipulation of the media by these powerful, affluent men was accomplished through stereotyping and Othering squatters. Eve Kornfeld's 1995 article "Encountering 'the Other': American Intellectuals and Indians in the 1790s" offered crucial insight into the parallels between representations of 18th century Native Americans and the squatters living in Sacramento, using the major strand of poststructural analysis known as "Othering". Squatters in the city were commonly depicted in the local press as stereotypically Irish: drunken, socially inferior, immoral, and alien. Noel Ignatiev's How the Irish Became White documented American nativists' views of Irish immigrants. My research uses similar textual and poststructural analysis to highlight the local media's Othering of Sacramento's squatters, placing it within the broader context of anti-immigrant, racist discourse in America. In the process, I hope to rescue Sacramento and its squatters from their traditional erasure from the historical narrative.

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123 10:00 am

Activism on the DL: The Gay Liberation Front at SDSU

John Gove, History (M)

The San Diego Gay Liberation Front was recognized as an official on-campus organization at San Diego State University in March of 1970. Less than a year later, the group's charter was revoked. While no official record offers a definitive explanation of why the GLF was banned from SDSU, multiple stories — such as one outlined on the website of the San Diego Pride organization — exist in the local cultural narrative. In addition, both archival evidence and ethnographic research indicate that though the GLF was ostensibly banned from campus in the early 1970s, the group continued to operate in an unofficial capacity through organizations such as the SDSU Experimental College, which offered free, non-credit courses taught by volunteers. Working in this clandestine manner, members of the GLF hosted lectures, operated a telephone support hotline, and organized events both on and off campus, including the San Diego "Gay-In," which many in the community consider to be the first San Diego Pride event.

Through an in-depth exploration of local archival and ethnographic resources, this paper more fully elaborates the history of the Gay Liberation Front both at San Diego State University and in the broader southern California region. Combining the official and unofficial narratives into a single historical record not only reveals the legal and cultural challenges the GLF faced, but also illustrates both the overt and subtle resistances the group's members employed in overcoming these challenges. By connecting this early

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gay-rights work to later local movements, this paper adds to the historical record of social activism that is still in progress today.

124 10:15 am

North Park: Decaffeinated Difference

David Bethe, History (M)

Built along San Diego City's planning strategy of developing into mixed-use urban villages, North Park is also a site of repetition of another quintessentially San Diego (indeed American) pattern: dispossession. The original inhabitants of the region, the Kumeyaay, were dispossessed by Spanish settlers in the name of God. Their descendants were dispossessed by white settlers in the name of Manifest Destiny. For the last two decades, working class residents and businesses have been pushed out of North Park, by changing consumer tastes.

Urban sociologist Sharon Zukin argues in “Naked City” (2010) that consumer tastes, indeed, the importance of taste as a class marker, have changed dramatically with the shift from industrial capitalism to consumer culture. Since 1945, industrial and ideological (marketing) innovations have spread the myth of America as middle-class. Increasingly, taste and style are the markers we attach status to, rather than productive identities. This linkage between purchase and identity reinforces social stability and absorbs overproduction, but is less healthy for the human psyche.

Today, North Park is a hip, diverse village within San Diego, but the coolness that makes the community so unique, is driving the area’s homogenization, following a development model Zukin outlined in “Loft Living” (1982). Previous local histories of North Park have been dominated by booster tropes, and used to draw in affluent consumers and residents while displacing those with less social capital. A sociological and political-economic lens is necessary to escape the booster ideological framework, to look past “sunny San Diego” and “hip urbanity” to see this space for what it is: a product of booster imagination designed for middle-class comfort and exclusion of others.

Following the methodological example of sociologist Sharon Zukin, I will use visual, textual, and psychological analysis to trace out middle-class desires and the institutions that cater to them, at Ranchos Cocina and Negociant winery. New forms of sexual and lifestyle acceptance in these spaces are articulated through bodily commodification. New spaces of belonging have exclusive price-tags and unspoken social rules. Sources include menus, local lifestyle publications, and my own on-site notes and photos.

Session A-5

Oral Interdisciplinary 2

Friday, March 1, 2019, 9:00 am

Location: Metztli

125 9:00 am

Examining human risk perception and decision makings toward wildfire evacuation

Ken Tominaga, Geography (U)

Social media have become one of the important communication channels for wildfire response agencies to disseminate evacuation warnings and orders. Nevertheless, evacuation decisions of individuals and households depend on various factors related to their risk perception. In this research, we analyzed geotagged social media data to examine the relationship between human risk perceptions and their evacuation response behaviors during the Lilac fire in San Diego, CA. The Lilac fire burned 4,100 acres, destroyed 157 structures, and damaged 64 structures started from December 7, 2017 and fully contained on December 21, 2017 in the northern San Diego County. Responsive agencies issued the total of 14 evacuation orders broadcasted via Wireless Emergency Alerts (WEA), Internet, and Twitter messages (or tweets). We created a structured codebook to analyze the relationship and coded 6,111 evacuation-related tweets, which were filtered from 53,539 tweets collected between Dec. 6th and 9th in San Diego County. The codebook categorized twitter contents with 22 factors including evacuation status, attitude toward evacuation, risk perception, information received, experience and knowledge, individual/family situation, and transportation situation. As direct factors explaining the evacuation decision, the coding result exhibited that 384 tweets contained one’s attitude toward evacuation (i.e., positive or willingness to evacuate, negative, neutral) and 232 tweets included evacuation status (i.e., not evacuated, pre-evacuation, evacuating, evacuated). We built two Bayesian network models to illustrate what factors affect individual decision makings and how each factor is related to other factors. A Bayesian network model is a useful method to visualize the conditional dependencies among a set of factors using a graphical representation. The results from two models revealed similar relationships where one’s attitude toward evacuation and evacuation status were both directly associated with two factors, 1) evacuation or wildfire information received from others and 2) risks perceived. Reliability of the information source is also indirectly related. While the Twitter platform is limited and tweets are known to be biased by demographic distribution, this study sheds light on understanding the human decision making process and behavior toward wildfire evacuation. This understanding can ultimately contribute to improve the current intervention strategy for the evacuation notification system.

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126 9:15 am

Computational Erosion Modeling of Archaeological Sites on San Miguel Island

Yesenia Garcia, Anthropology (M)

Archaeological sites are non-renewable resources increasingly pertinent to historical ecological studies for sustainability and conservation management. Preserving these resources is, therefore, a critical endeavor. One issue facing this work, however, is the amount of effort that needs to be expended to find, analyze, and prioritize the mitigation of current and future erosional damage to important archaeological resources. An interdisciplinary approach that combines empirical measurement and simulation modeling offers a way forward on this difficult problem.

I present here an initial case study of this methodology, which looks to quantify and rank potential future erosion damage to important sites on San Miguel Island, off the coast of Santa Barbara, California. I will use landscape simulation tools in GRASS GIS to simulate hillslope and channel erosion under a variety of climate and land-use scenarios. Much of the previous erosion mitigation research effort on the Northern Channel Islands has focused on coastal sites and coastal erosion processes such as storm-surge and waves. This new work will enable mitigation plans to also be developed for inland sites, which are of equal importance to coastal ones. In this way, we can better address and mitigate the loss of cultural heritage across all parts of the Northern Channel Islands and attempt to equally preserve all cultural resources. The workflow should be broadly portable to other parts of the world.

127 9:30 am

Impact of the Quantification Settlement Agreement on Hydrology of the Imperial Valley, California

Gabriela Morales, Geography (M)

The Quantification Settlement Agreement of 2003 (QSA) reduced the delivery of water to the Imperial Valley from the Colorado River, impacting hydrologic and agricultural dynamics that depend on the limited water supply. In accordance with the agreement, a series of water transfers between the Imperial Irrigation District (IID) and surrounding urban water districts was also implemented, which may have negatively affected the Salton Sea. In this study, I visualized hydrologic changes in the Imperial Valley by quantifying evapotranspiration (ET), precipitation (P), and discharge to the Salton Sea (Q) before and after the enactment of the QSA. ET calculated from the Imperial Valley surface water balance was also compared to satellite-derived measurements from Earth Evapotranspiration Flux (EEFlux). Biases in EEFlux ET were corrected using two methods, linear regression (ETCF1) and potential ET ratios (ETCF2). Preliminary results show a visual decrease in ET since the beginning of the QSA, as well as overestimation of remotely-sensed measurements from EEFlux. By monitoring evapotranspiration (ET) in the Valley and quantifying fluctuations in water consumption, we can inform decisions regarding which croplands need to increase water-use efficiency through better allocation practices.

128 9:45 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.

129 10:00 am

Building a Spatial Social Network of Public Discourse in Social Media (Twitter)

Jaehee Park, Geography (D)

Different cities have different cultures, political views, history, and demographic composition. These factors will affect public opinions and discourse regarding various political events or social movements in different cities. Given that people often express their perspectives and opinions based on various social media channels or messages, it is important to identify and locate where these messages come from. When compared to traditional media sources, social media is more open and accessible. Social media users are not only

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sharing user-generated contents but also participating in the process of creating and changing collective public opinions. In other words, social media is the venue of public discourse surrounding a certain social issue. This study investigates public discourse about racial and political issues on social media in a geospatial context and using a spatial social network. By studying two case examples, the Charlottesville attack on Aug., 2017 and the Tax reform issue on Nov., 2017, we analyzed Twitter's mention and retweet networks and constructed geographically-embedded social network analysis (SNA). While a spatial social network replies on the real-world coordinate systems to construct their notes (cities), a spatial social network can be used to visualize the connection between people's communications and the actual events in the real world. One of the research challenges is how to create a location of sender-recipient pairs. In previous studies, a spatial social network has been demonstrated in a way that compares the differences of social networks in different regions or generating a spatial social network by using a limited number of pairs when both nodes' location information is known in an existing dataset. In this study, the recipient's location information was parsed from their user profile and aggregated to represent a city level in a spatial social network. Therefore, a spatial social network reveals information flows between cities. The results of this study demonstrate different communities in the social network and a relationship between online social networks and geographic location in the physical world.

Session A-6

Oral Education 1
Friday, March 1, 2019, 9:00 am
Location: Templo Mayor

130 9:00 am

"It was hard, and it still is...": Women of Color Navigating HSI STEM Transfer Pathways

Briana Marquez, Communication (U)

Immersed in disciplinary cultures, historically characterized as predominantly White and male, competitive, economic-driven, and prioritizing individual advancement, women of color continue to be underrepresented in STEM fields. Hispanic/Minority Serving Institutions (HSIs/MSIs) and community colleges are critical entry points for many women of color in the STEM field and are crucial to understanding the issues of minority women in STEM. Participants from this study (n = 21) are from a larger study on STEM undergraduate/graduate students and recent alumni who attended Hispanic-Serving Institutions (HSIs) and successfully transferred from community colleges to 4-year institutions (n = 45). This study employs a theoretical perspective of science identity through an intersectional lens to highlight the narratives of women of color in STEM while navigating multiple institutions.

To understand the narratives of women of color in STEM, we held focus groups and follow-up video interviews, where the women in our sample discussed gendered and racialized experience within STEM disciplines and across multiple institutional contexts. To analyze our data, we used NVivo qualitative software and constant comparative analysis. We then identified and coded prominent themes found throughout the data. Highlighted findings/themes from their experiences were presumed incompetence as STEM students and professionals, navigating various institutional contexts, and the intersections of race and gender. Participants shared their experiences of discomfort and/or discrimination in the classroom where their peers (often white men) would question their intelligence in addition to apathetic attitudes from faculty members. Students often reported a heightened sense of community and felt more supported from faculty at community colleges and HSI's compared to a four-year university and non-HSIs. Both racial and gender identities were salient and inextricably linked in student's lives to influence the way they navigated the STEM disciplinary culture that is predominately White and male.

Our findings shed light on the inequities that continue to pervade STEM and the opportunities for transforming disciplinary and institutional contexts, particularly HSIs, to support, validate, and benefit from the unique contributions of women of color.

131 9:15 am

Communicating Restorative Practices in an Urban Public High School

Gloria Villarruel, Communication (U)

Students in underrepresented urban public high schools struggle more in school due to other problems happening at home such as trauma from abusive relationships, drug and substance use, and poverty. Many students who are constantly punished in school for behavioral issues are seen as problematic and a lost cause for many teachers, staff, and administration. The constant use of punishments and no improvement in student behavior reinforces the reality that there must be other ways to create change in students' behavior. This research explores how one urban high school is creating a positive school climate where students can succeed through the use of restorative practices (RP). Restorative Practices have been implemented in schools where there is a need to help students that have behavior problems through fostering communication, restoring relationships with peers and staff, and building a healthy community for all the parties involved.

132 9:30 am

Love the skin you are in: The Effects of Racial Affinity on Stress due to Health Concerns for Community College Students

Nexi Delgado, Education (D)

Background: Limited research has focused on the role of racial affinity (positive regards for one's own race/ethnicity) on stress, in particular concerning health concerns. This study utilized Ford and Harawa (2010) Two-Dimensional Ethnicity Social Construct as a guide to interpreting the data. The two-dimensional ethnicity social construct conceptualizes

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ways in which race/ethnicity can serve as assets for health behaviors and outcomes. Racial affinity was conceptualized as an asset stemming from positive self-regard for one's own race/ethnicity. Purpose: The purpose of the study was to understand the effects of racial affinity on stress due to health concerns for students of color in the community college. Methods: Data was collected through the Community College Success Measure (CCSM) of students attending the community college. The data was analyzed with Statistics Package for the Social Sciences (SPSS) using logistic regression to predict the effect of racial affinity on stress due to health concerns. Results: The findings demonstrated a significant negative association for Southeast Asians and Latinos with regards to stress due to health concerns. A significant negative relationship exists between racial affinity and stress due to health concerns. After controlling for racial affinity the relationship between Latinos and stress due to health concerns goes away indicating that racial affinity may partially explain reduced stress due to health concerns amongst Latinos. Conclusions: The results indicate that positive racial affinity may serve as a protective barrier to stress due to health concerns for students of color. This may have greater implications for the general population. Public Health officials should consider interventions that promote racial affinity to decrease stress because of health complications.

133 9:45 am

Navigating Identity

Darielle Blevins, Education (D)

African American girls in California's early childhood classrooms experience suspensions at five times the rate of the statewide average for girls (California Department of Education, 2018). During the Middle and High school years Black girls with school discipline records are more likely to experience formal and informal discipline from adults on campus than non-black students as described in recent research conducted by (Wun 2016, Evans-Winters 2011). Relationships established in the early years of life lay the foundation for children's self- concept including academic, social and relational identities. Relationships with teachers can be pivotal to early self-development. When relationships are characterized by tension and conflict, which can be a result of school discipline, they can cause adverse outcomes for identity development. This study seeks to understand the school experiences of African American girls from Early Childhood through their middle school years and its impact of their self-perception.

The purpose of this study is to share how girls visually express and contextualize their identities within school contexts. Ahn 2011 suggests, "Self-identity is changed and transformed through interactions with environment and diverse experiences" school experiences have significant impacts on how they develop their identity. Visual based methods provide an opportunity for children to exercise agency in expressing their own experiences. This study will employ visual methodologies as well as collect survey data of student demographics to fully understand the experiences of African American girls in school. The survey includes questions about their relationships with teachers and experiences with discipline from Pre-K to middle school. Statistical analysis will be employed to determine if a relationship exists between early childhood and middle school classroom and campus experiences. The visual methodology employed is a drawing elicited interview based on a dual self-portrait in which one side represents how she feels on the inside and the other side represents how she thinks society sees her. Content analysis of pilot data indicates middle school girls create different visual representations of their view of themselves versus how society views them. Themes included masking inner pain and insecurities with outward beauty.

134 10:00 am

The Impact of Dual Language Programs on Suspension Rates of Black Males

Reka Barton, Education (D)

In an effort to move toward educational reform and equitable practices in school, more research is needed to uncover the benefits of Dual Language programs for black students. In studying the relationship between the suspension rates of Black students in bilingual programs compared to those enrolled in traditional schooling, I am hypothesizing that there are significantly lower rates of suspension among students in bilingual programs. This lower rate can possibly be attributed to the intentionality of the Dual Language programmatic structure, which includes a value of ethnically and linguistically diverse communities. Effects of Dual Language programs also include; language minority students experience more long-term educational gains than students in other programs (Thomas & Collier, 2002), (Tong, Lara–Alecio, Irby, & Kwok, 2008) and students' self-esteem is enhanced (Irby et al., 2011). Both of these are factors that will greatly benefit Black students, (Black boys in particular) as this group of students is most negative affected by current educational practices. Though bilingual education and multicultural education are distinct educational elements, we purport that they exist in a symbiotic relationship known as mutualism. (Irby et al., 2011). When this collaboration exists and is executed with fidelity, it fosters a sense of community in the classroom and the school, where students are positioned for success. For the purpose of this study, I will conduct a factorial analysis of variance to compare the discipline rates across the program types and race.

"African American boys are segregated in our educational system and tracked into the prison industry, the permanent underclass, and into a lasting reliance upon social services. San Diego Unified School District has the highest total suspensions of Black males in the county" (Wood, J. L., Harris III, F., Howard, T. C., & Abdi, M, 2018). This study would initiate a conversation and provide evidence for the effectiveness of dual language programs in public schools as a means of better educating and supporting our Black male youth. After the initial phase of study, further research will be done to expand the results to include the entire state of California as well as Black female youth.

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

135 10:15 am

Investigating How Secondary Mathematics Teachers' Use of Curriculum Materials can Support English Learners' Engagement in Mathematical Practices

Lynda Wynn, Mathematics and Science Education (D)

Emergent bilingual (EB) students and their teachers face a distinctive challenge in secondary mathematics as EB students must simultaneously learn mathematics and the language of instruction. This study examined how eleven mathematics teachers in two linguistically diverse high schools used curriculum materials to design lessons that engage their EB students classified as English Learners in valued mathematical practices. The study uses a contrastive design, examining curriculum used by teachers in schools that use different Common Core-aligned curricula that provide different types of guidance for teachers to support EB students. Remillard's (2005, 2009) framework for the teacher-curriculum interaction provides a conceptual framework for this study, and the data collection included textbook materials, lessons, planning interviews, observations of lessons, and debriefing interviews. The analysis used qualitative methods, such as the creation of checklist matrices (Miles, Huberman, and Saldaña, 2014), analytic memos (Maxwell, 2013) and both deductive and inductive coding (Miles et al., 2014), and was conceptualized to investigate the teacher-curriculum interaction as teachers plan lessons for their students, particularly attending to the ways in which the text, planned curriculum, and enacted curriculum support EB students. Findings of this study include: (1) all of the participating teachers in this study modified their schools' adopted curricular resources for use in their lessons, often demonstrating consistency in the types of modifications they made as well as their expressed reasons for the changes; (2) the participating teachers had differing notions of what constitutes a mathematical practice, as well as varying interpretations of the Common Core Standards for Mathematical Practice, and (3) students have more opportunities to produce academic language when more than two representations of a function (graph, table, situation, and equation) are emphasized in the curriculum. Results of this study provide better understanding of the ways in which curricular resources support teachers working with EB students and can guide those seeking to improve curricula for instructors in linguistically diverse settings.

Session A-7

Oral Behavior and Social Sciences 1

Friday, March 1, 2019, 9:00 am

Location: Visionary Suite

136 9:00 am

Eating Disorders and Neurocognition: Results from a Nationally Represenatitive Sample

Da Yeoun Moon, Psychology (U)

Background: Individuals with eating disorders (EDs) demonstrate deficits in several cognitive domains. Previous studies examined neurocognition in adults and adolescents, for whom the effects of ED duration may account for neurocognitive deficits. Capturing the neurocognitive profile of children with EDs, before cognitive changes due to the disorder become prominent, may provide evidence for temporality of neurocognitive deficits. Method: The current study assessed differences in neurocognitive functioning between children with and without EDs using data from the Adolescent Brain Cognitive Development study. The study comprised a nationally representative sample of 4,525 children, aged 9-10 years. Results: There were no significant differences between children with and without EDs on the measure of impulsivity (Cash Choice Task; Odds ratio = 1.35, $\chi 2$ [4523] = .94, p = .42), reading ability (Oral Reading Recognition Task; B = -0.81, p = .78), information processing (Pattern Comparison Processing Speed Test; B = 3.08, p = .41), working memory (List Sorting Working Memory Test; B = 0.51, p = .81), verbal intellect (Picture Vocabulary Task; B = -1.42, p = .49), attention (Flanker Task; B = 3.77, p = .09), cognitive flexibility (Dimensional Change Card Sort Task; B= 2.60, p = .46), spatial visualization (Little Man Task; B <.001, p = .80), episodic memory (Rey Auditory Verbal Learning Test; B = 0.39, p = .40), fluid reasoning (Matrix Reasoning Task; B = .24, p = .59) or crystallized (B = -1.72, p = .52) and fluid intelligence (B = 1.58, p = .56). Children without EDs performed significantly better than children with EDs on the abbreviated assessment of episodic memory (Picture Sequence Memory Test; B = -5.48, p = .01). Conclusion: Neurocognitive deficits in individuals with EDs may result from a long duration of physical and psychological changes related to the disorder.

137 9:15 am

Hospital Ownership and Location Increasing Health Disparities Among Medicare Recipients

Alanah Kayla Castillo, Public Health (U)

Background:

Hospitals in United States are expected to uphold evidence-based guidelines to provide patients with the highest standard of care regardless of structural features. However, embedded inequalities in the U.S. healthcare system still result in disparities.

Medicare patients' average length of stay (ALOS) give further insight on the hospital's quality of care with respect to hospital ownership as well as location and is measured in the amount of days a Medicare recipient remains under the care of a particular hospital. The objective of this analysis was to view ALOS as a measure of quality of care and assess hospital ownership and location throughout the United States.

Methods:

This study compares average length of stay for Medicare patients of hospitals across varying contextual organizational structure factors in California using the American Hospital Association (AHA) database for 2014, which contains secondary data on all Joint Commission accredited hospitals throughout the United States.

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

Results:

Most hospitals in the United States are not-for-profit (53%), and most are in more sub-urban and urban areas, with only 34% of hospitals in rural/micro areas. Medicare ALOS was 8.16 days with a standard deviation of 10.43. ALOS differed significantly across geography and ownership.

ALOS among Medicare recipients was compared across hospitals and their location. At the rural level, ALOS differed significantly between government owned and not-for-profit hospitals [1.5763 day different, p<0.0287]. At the urban level, ALOS differed significantly between government owned and not-for-profit, not-for-profit and for-profit, as well as government owned and for-profit [2.2826 day difference and 3.7196 day difference and 1.4370 day difference, p<0.0001]. Additionally, at the urban level, ALOS differed significantly between not physician owned and physician owned hospitals [2.3039 day difference, p<0.0001].

Discussion:

An association between Medicare recipients' average length of stay and hospital ownership can be an indicator for the hospital's quality of care. Medicare patients admitted into for-profit and government owned hospitals in urban areas could experience lower quality (longer ALOS) than that of patients admitted into not-for profit hospitals. At the rural level, Medicare patients admitted to government owned hospitals could also have the same experience.

Specifically in urban areas, our analysis showed a significant difference that hospitals that are not physician owned were associated with higher ALOS, suggesting they may provide lower quality of care than physician owned hospitals. Moreover, health disparities due to hospital ownership or funding and location call for further research to offer the best quality of care to all patients.

138 9:30 am

Characterizing Information Structures and Processes Related to Cancer Screening in U.S Medicare Population

Melissa Yakuta, Business Management Information Systems (U)

BACKGROUND: The cancer survivor population is growing in the United States. The survivor population is predominantly over the age of 65 and requires special care coordination and planning. In cancer care however, care responsibilities are especially complex and fall on patients and their families. Information flow and care processes within hospitals in the United States are examined to determine whether they are adequately prepared for aging adults, especially in cancer survivorship.

METHODS: The 2014 American Hospital Association (AHA) dataset was utilized to analyze the participation of hospitals in cancer screening from virtual colonoscopies on Medicare average length of stay (ALOS) as a measure of quality of care.

RESULTS: Across the United States, the average length of stay (ALOS) was 8.16 days. 32.91% of hospitals were located in rural areas. Only 23.69% of hospitals across the nation had cancer programs approved by the American College of Surgeons but 94.79% of hospitals were Medicare certified. Only 25.59% of U.S hospitals offered cancer screening services in the form of virtual colonoscopies, 48.38% of hospitals offered geriatric services, 46.60% offered psychiatric geriatric services, 10.88% offered adult day care programs, and 13.20% offered Alzheimer centers. Hospitals that had cancer programs (ALOS 5.38 vs 9.05 days; p<.0001), Medicare certifications (ALOS 8.11 vs 11.28 days; p=.0057), virtual colonoscopies (ALOS 6.34 vs 7.74 days; p<.0001), geriatric services (ALOS 6.67 vs 8.03 days; p<.0001), and adult day care (ALOS 6.38 vs 7.49 days; p=.0085) reported shorter ALOS than those that did not.

DISCUSSION: Organizational information structures and processes impact the number of days patients spend in hospitals. The information structures, care processes, and the average length of stay relate to the quality of care cancer patients receive. Whether or not these are able to support the aging cancer population must be further analyzed along with other factors like geography.

139 9:45 am

HIV infection association with TB loss to follow-up among a presumptive TB cohort of rural Uganda

Briana Thrift, Epidemiology (M)

Introduction

Tuberculosis infection is the second leading cause of mortality worldwide, claiming more than 10 million cases and 3 million deaths annually. In the context of Sub Sahara Africa, TB cannot be adequately discussed in isolation of the global human immunodeficiency virus (HIV) epidemic. This study proposes to investigate the association between HIV and tuberculosis co-infection and TB diagnosis and treatment outcomes among suspected tuberculosis patients in Mbale, Uganda.

Methods

Study Design

We carried out a retrospective cohort analysis to review TB patient clinical records in 5 health facilities of Mbale district, Uganda. We analyzed our study variables utilizing data extracted from Ugandan clinical registrars. Study participants included in this study were TB presumptive patients seeking care at Mbale health facilities, between the dates of 1st July 2017 to 30th September 2017. Presumptive, laboratory, and treatment physical registrars were assessed. A total of 168 presumptive TB cases were systematically selected from registrars. Patients were included in the study if they met the following criteria: age >= 18, presumed as a TB patient and recorded in the presumptive designated registrar during our study period of July 1, 2017 – September 30, 2017, and TB patients seeking care at one of the selected government-funded health facilities. The data extraction form captures the following information: patient ID, age, village, health facility, HIV status, and other indicator variables. Collected data was entered in Microsoft Excel 2016 database through dual entered procedures. Statistical analysis was completed using SAS 9.0 Statistical Software. The dependent TB LTFU variable was

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analyzed as dichotomous, either yes or no. The exposure variable was dichotomous as well, as either HIV positive status or HIV negative status. Study analysis are still ongoing to assess significance of variables, confounders, and effect modifiers.

Preliminary Findings

The mean age of our sample was 41.5 years and about 25% of our participants were HIV+. At the bivariate statistical analysis level, age, HIV status, and diagnostic tests were found to be significant variables, prior to adjusting for confounders and effect modifiers. Statistical analysis are ongoing to control for study biases.

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140 10:00 am

Predicting HIV viral suppression by 12 months after HIV diagnosis in Rural Uganda

Alexandra Almeida, Interdisciplinary Research on Substance Use (D)

Background

In Uganda, despite the efforts in expanding access to antiretroviral treatment, in 2018, 81% of the people living with HIV were aware of their HIV status, from which 89% were on treatment, and from these, 78% achieved viral suppression (viral load was at undetectable or low levels).

This study aims to examine individual-level factors which are associated with failure to achieve viral suppression within 12 months of HIV diagnosis in a cohort of newly HIV diagnosed people in rural Uganda.

Methods

Data for this study comes from the PATH (Providing Access To HIV Care)/Ekkubo Study, which is a large cluster-randomized controlled trial in rural Uganda designed to compare the efficacy on an enhanced linkage to HIV care intervention versus standard-of-care. For the present analysis we use only data from the standard-of-care control group.

Participants who are newly diagnosed with HIV at study enrollment complete questionnaire interviews at study enrollment and 12 months later. Measures include demographic and household characteristics, previous HIV testing and HIV stigma. Viral load testing is performed at enrollment and at 12 months. The data analyzed in this study comprises the period from November/2015 to September/2018.

A measure of socioeconomic status was calculated using factor analysis, based on the household's characteristics. We used logistic regression with the outcome being viral suppression at 12 months (0: not virally suppressed, 1: virally suppressed), and predictor variables and controlling for baseline viral load. Adjusted Odds Ratios (AOR) were calculated as measures of associations.

Results

From the 148 people included in the analysis, 39.90% achieved viral suppression at 12 months. There were more females (64.20%) than males (35.8%) in the sample, average age was 30 (ranging from 15-58 years). A small percentage (7.4%) of the sample had viral suppression when they were diagnosed and enrolled into the study.

Anticipated HIV stigma at enrollment, showed the strongest effect in predicting viral suppression at 12 months: an increase of 1 unit in on the stigma scale (0-4 range) increased the chance of a person not achieving viral suppression by 285%. The findings also showed that the older a person is, fewer chances they have of not achieving viral suppression (AOR: 0.93, IC: 0.89-0.98). Being between the middle class also reduces in 81% the chances of not achieving viral suppression (aOR: 0.19, IC: 0.06-0.66). Men had greater odds of not achieving viral suppression (AOR: 2.22, IC: 0.91-5.56) than did women.

Conclusion

In this study, we find that the combined higher anticipated stigma, lower age, lower financial class, and being a man are attributes related to an increase of chances of not achieving viral suppression. These findings can inform future public health interventions by determining which individuals may most need and benefit from an intervention to help them achieve HIV viral suppression.

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141 10:15 am

Its about time: mitigation of lexical access delays in aphasia

Carolyn Baker, History (D)

Individuals with Broca's aphasia, a language disorder secondary to stroke, have selective difficulties comprehending complex sentence structures such as (1) and have been shown to exhibit a delay in accessing the meaning of words (i.e. lexical access) during sentence processing.

The girl$_i$ that the boy pushed _____$_i$ was in the park.

Using an eye-tracking while listening in a visual world paradigm, we examine the moment by moment processing that occurs as linguistic information is presented to human listeners to investigate how a delay in lexical access affects syntactic processing (such as the linking of a verb and its direct object, sentence 1 above). Specifically, we are interested in testing the Delayed Lexical Activation hypothesis (DLA) which proposes that a delay in lexical access feeds semantic information to the processor too slowly, resulting in disrupted syntactic processing and impaired final comprehension of complex sentences for individuals with Broca's aphasia (Love et al., 2008). In the present study, we look to allow for more time to access the meanings of nouns in a sentence by introducing three novel manipulations within sentences: (1) lengthening the duration of the direct object, (2) adding a disfluency ('uh') after the direct object, and (3) adding a silent pause after the direct object.

Results from neurologically unimpaired college-age students (n=28) replicate prior results with other methods that show that upon hearing noun phrases in a sentence, looks to the picture of that noun increase, which we take as evidence of initial lexical activation. At the post verb position (pushed in sentence 1 above), there is lexical re-activation showing a successful linking of the direct object (the girl) with its original post verb position. Results from a growth curve analysis showed that the disfluent and silent conditions significantly increased the rate of re-activation of the target item/noun phrase proportion

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(disfluency =.16, 95% C.I. [.06, .25], p=.009; silence =.11, 95% C.I. [.02, .2], p = .015). Individuals with Broca's aphasia and age-matched unimpaired control participants are currently being tested to see if aging or damage to specific brain regions show a different pattern in the manipulated conditions.

Session A-8

Oral Behavior and Social Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Legacy Suite

142 9:00 am

Management of Complainability on an Online Review Platform: An Examination of the "Doctor" Category on Yelp

Justin Alecock, International Business (U)

Complaints arise when an individual expresses their dissatisfaction with an experience because it deviates from the expectations they had previously set. In a business setting, complaints express a misalignment of what the client expected of the business and the lack of proper deliverance of a service on the business' part. However, complaining can be an interactionally delicate matter. Depending on how they are conveyed and constructed, complaints can turn out to be beneficial or harmful. Even more delicate than the complaint itself is how the complaint is handled; the ability to handle complaints effectively is often critical for the reputation and success of a business.

This presentation reports on a study which examines the expression and management of complainability and its coupling with language structure in American culture on an online review platform. Specifically, based on the principle of stratified random sampling, we collected 1,000 cases from the 25 largest metropolitan areas in the United States in the "Doctor" category on Yelp.com. By focusing on cases that both solicit a response from the Doctor's office and solely complain about the Doctor, our research revealed several intriguing observations as to how complaints are performed and responded to. We hope to contribute to linguistics literature, the business world, and the emerging research field of online customer reviews by offering insights from usage-based linguistic and social-interactional approaches on the construction and negotiation of complaints.

143 9:15 am

Sex-related bias in arrow-based Simon task

Adam Freudenberg, Philosophy (U)

Processing of visual features related to objects and space relations occurs within separate cortical streams that interact with selective attention. Such separation has implications for cognitive development because the perception of 'what' and 'where' provide a neural foundation for the development of aspects of higher cognition. Thus, a small attentional bias in early development for attending to one aspect over the other might influence subsequent higher cognitive processing in tasks involving object recognition and space relations. In this experiment, we employed an arrow-based visual Simon task to demonstrate the presence of a bottom-up bias for spatial processing for males by measuring reaction time and accuracy. Participants were asked to respond with a key press to the direction that an equilateral triangle was pointing, either to the left or to the right. Two conditions were used, one in which the triangle was situated in one of two locations within a square frame and one without the frame all together. 93 participants were tested where males exhibit a significantly faster reaction time as compared to females. No differences in accuracy or simple reaction time were observed. This suggests a differential functional and structural organization between males and females which results in a bias for spatial or object processing respectively.

144 9:30 am

Journalist–Practitioner Relationships: Measuring Coast Guard Public Affairs Media Relations and Framed News Values

Jason Neiman, Mass Communication and Media Studies (M)

As the partial United States government shutdown loomed and the lapse of appropriations was debated by national leaders, work to manage the narrative and public opinion by media relations professionals was difficult to ignore. Organizations rely on the work of public relations professionals to build and maintain relationships with journalists, but digital and social media have changed how practitioners disseminate messages to their target audiences. With newsroom staffs reduced and public trust in the media wavering, journalists have a difficult job and source relationships remain integral to their role as information gatekeepers. This dynamic media environment has led to the primary research question posited: How are practitioners working with journalists and what is the current state of their relationship?

This research project will utilize a multi-method approach to analysis current media content and survey both operational U.S. Coast Guard public affairs specialists and those working journalists who cover their organization. These methods will serve to identify possible factors that help or hinder the relationship between journalist and practitioner. Utilizing both framing and gatekeeping theory, this study will identify what common newsworthy factors are emphasized most to garner media coverage. While data collection is ongoing, and analysis is to follow, it is expected this research will also serve to advance relationship theory, as findings may identify possible mediating variables – like news value – in quality relationship building with journalists.

from this study may confirm a trend that although journalists indicate an unfavorable opinion of the public relations field as a whole, they do not assign negative opinions to the individual practitioners with whom they have direct interactions with. The implications from this public relations thesis may be greatest for practitioners as new relationship techniques are determined. This study will be completed this spring in partial fulfillment of my mass communication and media studies program in the School of Journalism and Media Studies.

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

145 9:45 am

Illegal and Legal Immigration and its Relation to Media in the San Diego-Tijuana Borderlands

Jesus Dominguez, Mass Communication and Media Studies (M)

Previous research has said that while public support for new immigrants has never widespread, it has been particularly scarce in recent years (Fetzer, 2000; Kinder & Kam, 2009; Lapinski, Peltola, Shaw, & Yang, 1997; Valentino, Brader, & Jardina, 2013). In fact, recent events in the San Diego-Tijuana border region have demonstrated that public support for new immigrants has been on the decline. The recent arrival of the Central American migrant caravans has sparked protests by Mexicans and has caused the United States to close the port of entry during periods of protest in Tijuana. The proposed study seeks to conduct in-depth interviews with students who crossed the United States-Mexico border once a week for a class in Tijuana. The border region has not experienced an influx of migrants who have received extensive media coverage as the Central American caravans. Therefore, it is of interest to converse with students who are exposed to both sides of the border to gain an insight on the perceptions, attitudes, media, and sources that shape student's opinions regarding illegal and legal immigration and the migrant caravans arriving to Tijuana.

146 10:00 am

Filling in the Gaps: A Needs Analysis of Refugee Students in Secondary Settings

Olivia Mullen, Applied Linguistics/TESOL (M)

With the enrollment of English language learners (ELLs) in US classrooms continuously on the rise, subject-area instructors are faced with the challenge of finding a balance between facilitating learners' development of academic language while maintaining a focus on disciplinary content. Reading intensive subjects such as history and science have proved especially difficult for this demographic. In response to these issues, research in content-based instruction (CBI) under the functional linguistics framework has proposed language analysis strategies for instructors to teach subject matter through the language of their disciplines. Thus far this literature has typically centered on the general ELL profile; that is, immigrant learners or children of immigrants with limited research on the unique characteristics of refugee students who may have limited formal education. The current project aimed to explore the diverse ELL population by conducting a needs analysis of high school refugee students at a San Diego after-school tutoring program in order to verify previously identified literacy concerns as well as bring to light additional obstacles. A survey was administered to collect information regarding learners' language and literacy background, educational history prior to resettlement and impressions of their perceived struggles with reading in their current classes. Interviews were conducted with students' tutors and program coordinator to ascertain further details related to these issues. Results from this endeavor may be used to inform lesson plans for tutors and instructors to ameliorate specific linguistic challenges for adolescent refugee students with developing academic literacy. Furthermore, as San Diego County continues to welcome the largest number of refugee families in the state, these findings hope to begin a larger conversation for collaboration between content and language teachers to assist refugee youth in the San Diego area.

147 10:15 am

Looking Beyond the Walls of Academia: Using Praxis for Student Instruction

Charlene Holkenbrink-Monk, Education (D)

When graduate students enter their programs, often times the assumption is that they will continue in academia. While academia is a viable choice, it seems that the concept of praxis is forgotten. Freire's (2000) idea of praxis is that of critical reflection and action, and should be sought after for graduate level work. The Dignified Learning Project (DLP) was a nonprofit organization born out of the theoretical underpinnings of praxis and has actively engaged in social justice oriented work within community-oriented settings. By situating itself as an organization that navigates the sociopolitical realities of the world while using social philosophy to inform its programming and interactions, The DLP is the epitome of a graduate level praxis-informed project. By using The DLP's philosophical foundations and the programs it has created, this research will discuss praxis and its necessities for graduate level education in order to encourage our students to make necessary social change toward equity and liberation.

Session A-9

Poster Health and Nutrition & Clinical Sciences 1
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

148 9:00 am A

Real-Time Monitoring of Heart Failure Biomarker Atrial Natriuretic Peptide Using Ultrasensitive Laser Wave-Mixing Spectroscopic Detection

Irving Chavez, Biochemistry (U)

Nonlinear laser wave-mixing spectroscopy is presented as an ultrasensitive detection method for heart failure biomarkers pro-atrial natriuretic peptide (proANP) and brain natriuretic peptide (BNP). Wave mixing is an ultrasensitive optical absorption-based method, and hence, it can detect both fluorescing and non-fluorescing biomarkers. One can detect biomarkers in their native form, label-free, without the use of time-consuming labeling steps. The wave-mixing signal beam is strong, collimated and coherent (laser-like) and it can be collected by a simple photodetector with an excellent signal-to-noise ratio (S/N). Capillary electrophoresis yields excellent separation of proANP and BNP in serum and it can be effectively coupled with our laser detection system. The wave-mixing signal has a cubic dependence on laser power

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and a quadratic dependence on analyte concentration (an ideal sensor). Compared to currently available detection methods, wave mixing offers several inherent advantages such as small sample requirements, ultrasensitive detection limits, and native label-free detection of various biomarkers, viruses, explosives. Our nonlinear multi-photon detectors can be easily configured as portable battery-powered devices that are suitable for use in field work. Potential real-world applications include detection of various biomarkers, cancer cells, viruses, single cells and reliable early detection of diseases.

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149 9:00 am B

An induced pluripotent stem cell (iPSC) model to study mechanisms of non-alcoholic fatty liver disease (NAFLD) associated with PNPLA3 polymorphisms in human hepatocytes

Bana Alani, Microbiology (U)

Alcoholic fatty liver disease (NAFLD) is a prominent cause of chronic liver disease and a major indication for liver transplant in both children and adults. Genome-wide association studies (GWAS) have found a single nucleotide polymorphism (SNP) variant in the gene PNPLA3 that is highly associated with hepatic fat content, with the variant allele of PNPLA3 being associated with more severe biochemical and histological features of NAFLD. It is known that PNPLA3 is involved in lipid processing, however it`s true in-vivo function in human hepatocytes is currently unknown. Using TALEN technology, we generated a set of isogenic lines from human induced pluripotent stem cells (iPSC) of known genetic background with the variant (VAR) and wildtype (WT) homozygous alleles of PNPLA3. Our prior studies validated this model by showing that VAR hepatocytes accumulate triglyceride-rich lipid droplets (LDs) and produce pro-inflammatory cytokines involved in NAFLD progression. To mimic lipotoxicity, we use palmitic acid (PA), a toxic fatty acid that is prevalent in diets that are rich in saturated fat. To further understand the link between fat accumulation and inflammation that determines progression of NAFLD, we are characterizing the morphology, lipid and protein composition of LDs. This aim is motivated by the increasing evidence that LDs are metabolically active organelles that can affect cellular function. We will characterize LDs number and size by microscopy and flow cytometry. We will determine lipid composition of purified LDs by mass spectrometry to measure amount and subtypes of triglycerides, sterol esters and fatty acids. Lipid droplets are also involved in compartmentalization and amplification of eicosanoid synthesis. We will purify LDs from (WT) and variant hepatocytes and measure levels of bioactive lipids that are known to serve as substrates or mediators of inflammation such as PA. Our work will open the door to a new range of experimentation in elucidating the mechanism underlying the association between PNPLA3 and NAFLD, predictive diagnostics and therapeutic discovery.

150 9:00 am C

Modeling Calcium Kinetics Of Neural Cognitive Disorders With hiPSC Derived Neuronal Cultures

Isaura Villalba, Cell and Molecular Biology (U)

Human induced pluripotent stem cells (hiPSCs), have been beneficial for modeling poorly understood diseases, specifically psychiatric disorders. By utilizing hiPSCs, animal modeling, and primary human brain material, we have generated a strongly supported hypothesis that the psychiatric disease bipolar disease (BPD) is through the protein collapsin response mediator protein (CRMP2), that controls the form and function of dendritic spines (collapsin response mediator protein-2 (CRMP2)) and hence neuronal network activity. It is unknown how this pathway mechanistically changes these neuronal structures. If this were known, better drug targets and drugs might be devised for treating BPD. In addition, there is significant overlap in the etiology of bipolar disease and other neurodegenerative diseases such as Alzheimer's (AD). Not only is CRMP2 central to BPD, but it is also associated with AD pathophysiology(Nunes et al, 2013 Curr Alzheimer's Res). Our research focuses on understanding how abnormalities in CRMP2 underlie BPD and drug induced psychosis in conjunction with AD. Through the use of looking at neurons generated from hiPSCs and transgenic mouse models, we will attempt to discern this mechanism. The techniques will involve neurite proteomics, electrophysiological assessments of network formation (via multi-electrode array), and calcium kinetic imaging. By deriving neuronal cultures from human bipolar disorder iPSCs, we can observe how CRMP2 mediates neurological processes relevant to psychiatric disorders in conjunction with testing how stimulants known to induce psychosis impact key psychiatric genes such as CRMP2 and phenocopy psychiatric disorders at the cellular and molecular level.

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151 9:00 am D

Post Translational Modifications in MDH1 May Affect Lung Cancer Survival

Sati Alexander, biology (U)

Cancer cells often alter their metabolism by increasing rates of glycolysis and altering pathways to support proliferation. This metabolic shift to aerobic glycolysis is known as the Warburg effect. Cytosolic malate dehydrogenase 1 (MDH1) is amplified in squamous cell lung carcinomas which corresponds to a 50% reduced rate of progression free survival for patients. The role of MDH in normal cells is to catalyze the conversion of oxaloacetate (OAA) and malate using NAD+/NADH. MDH drives glycolysis by providing NAD+, which is crucial in cancer due to reliance on this pathway. We have previously shown that metabolic dehydrogenases can be regulated by features of the tumor microenvironment, including pH, oxidative stress, and hypoxia, but it is not yet known how these features affect MDH1 activity. Post-translational modifications may affect MDH1 activity in lung cancer. However, the effects of post-translational modifications on

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MDH1 and cancer phenotypes are unclear. Our goal is to understand the mechanism of MDH1 activity in lung cancer by mimicking a tumor microenvironment such as oxidative stress. We will be using kinetic techniques on wild type and mutant MDH1 to explore the role of post-translational modifications on a cysteine residue in MDH1. We hypothesize that the irreversible oxidation of cysteine can impact its activity, while post-translational modification may protect this cysteine residue. Examining the effect of post-translational modifications and tumor microenvironment-based regulation can establish the downstream effects of oxidative stress and pH to drive cancer. Ultimately, we hope to demonstrate MDH1 to be a future therapeutic target for squamous cell lung cancer.

152 9:00 am E

HPV Vaccination in Pediatric Oncology Survivors

Yesenia Avitia, Microbiology with an emphasis in Clinical Laboratory Science and Public Health (U)

Human papillomavirus (HPV) vaccination reduces the risk of cervical and other cancers. HPV vaccination rates are low among 13- 17 years old and it is estimated that 60% have one or more HPV vaccinations. Pediatric oncology survivors have a greater risk of acquiring this infection, which increases their risk of future HPV-related cancers. Limited information exists about HPV vaccination behavior in children with cancer. This study assessed the proportion of pediatric oncology patients who received HPV vaccination, defined as having received at least one vaccine. It further evaluated differences in HPV vaccination by health literacy level and by Hispanic ethnicity. A cross-sectional study of 148 parents or guardians of childhood cancer survivors were administered questionnaires to assess their child's HPV vaccination status, health literacy, and ethnicity. Parental health literacy was measured by Newest Vital Sign (NVS) and categorized into three groups: low health literacy, limited health literacy, and adequate health literacy. Of the 148 parents or guardians, 27.7% reported their child had at least one HPV vaccine. 15% of parents or guardians who had low health literacy reported HPV vaccination. HPV vaccination was reported by 37% of parents or guardians with limited health literacy; whereas those with adequate health literacy, 28% reported their child had been vaccinated. HPV vaccination prevalence was lower in Hispanic (25.0%) than non-Hispanic (31.2%) childhood cancer survivors. Interventions to increase HPV vaccination in pediatric cancer survivors are warranted, especially in survivors who are Hispanic or with low health literacy.

153 9:00 am F

Impact of Hospital Safety Net Burden on Oncology Patterns of Guideline Concordant Care

Katelyn Bachand, Biochemistry (U)

Background: The Commission on Cancer (CoC) has developed national, standardized guidelines for the treatment of 10 different primary sites of cancer. These measures can be used to assess the quality of care at a hospital level. Safety net hospitals are hospitals that deliver a high volume of care to medicaid patients or patients with no insurance. Those hospitals rely on federal funds (medicaid DSH payments) for uncompensated care. Therefore, they are legally obligated to care for patients regardless of insurance status or ability to pay.

Methods: 2,465,503 patients were chosen for this cohort from the National Cancer Database (NCDB), which is a national oncology database that contains approximately 34 million records with data from over 1500 CoC accredited institutions. This database is particularly useful for its extensive patient and facility information between the years 2004-2015. The patients from the NCDB were chosen from selection factors provided by the CoC quality metrics. Statistical Analysis System (SAS) was used to code for our cohort, divide facilities into low, medium, and high burden hospitals, and perform chi-square tests and multivariable logistic regression.

Results: The guideline concordance of these hospitals is mixed. In 6 out of 20 measures, a low safety net burden is statistically significantly associated with more guideline concordant care. In 5 of the measures, high safety net burden hospitals perform better. Some variables accounted for included hospital burden, hospital volume, patient median income, and race/ethnicity. Safety net burdened hospitals took on a larger portion of lower income and urban or rural patients. These patients were also more likely to be a race other than white and have a later staged cancer diagnosis.

Conclusion: Although safety net hospitals did not perform lower than their counter parts on each measure, these results still present important considerations as physician reimbursement shifts toward a quality based care compensation policy. If high burdened hospitals are underperforming, they may not get paid sufficiently. This could increase health disparities for the vulnerable populations that these hospitals care for.

Session A-10

Poster Health and Nutrition & Clinical Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

154 9:00 am G

Isolation of Mealworm Tropomyosin, a Potential Cross-Reactive Food Allergen

Emily Woolf, Exercise Physiology and Nutrition (M)

Edible insects are a promising food source due to high feed conversion rates, good nutritional values, and low environmental footprints. However, potential safety issues associated with edible insects need to be identified and addressed, for example insect-induced food allergy. Several insect proteins areidentifiedas putative pan-allergens including mealworm tropomyosin. Therefore, the purpose of this study isto isolate mealworm tropomyosin for subsequent molecular and immunological characterization. Mealworm (Tenebrio

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molitor) larvae were purchasedfrom a local insect farm and euthanized by refrigeration at 4°C for 16 h followed by freezing at -80°C for 30 min. Frozen mealworms were ground to a fine powder, then defatted with ten volumes of acetone three times. Acetone-defatted mealworm powder was extracted with 1.0 M NaCl, 10 mM β-mercaptoethanol (pH 7.0) at a ratio of 1:10 (w/v) by magnetic stirring at 20°C for 16 h. Soluble mealworm proteins were subjected to isoelectric point (pI) precipitation at pH 4.6 three times followed by ammonium sulfate (AS) fractionation at 20-30%, 30-40%, 40-50%, 50-60%, and 60-70% saturations. Supernatants and precipitants from the pI precipitations and AS fractionations were subjectedto sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). SDS-PAGE analysis showed repeated pI precipitations removed polypeptides from 40 to 65 kDa and below 26 kDa and concentrated tropomyosin (37.0 ± 1.2 kDa) along with polypeptides at 136, 95, 82, 72, and 67 kDa. The 72-136 kDa polypeptides became insoluble at 40% AS saturation while tropomyosin and the 67 kDa band remained soluble. Increasing the AS saturation to 50% precipitated mealworm tropomyosin and the 67 kDa polypeptide. A few polypeptides around 34 kDa were soluble at 50% AS saturation, butno polypeptide was soluble at 60% or higher AS saturation. In conclusion, tropomyosin can be isolated together with a 67 kDa polypeptide from mealworm through pI precipitation at pH 4.6 followed by 40-50% AS fractionation. This study provided a relatively straightforward method to isolate large quantities of mealworm tropomyosin for additional purification in which column chromatography will be employed. Isolation of this potential food allergen is important for understanding its molecular characteristics and for developing specific detection, diagnosis, and immunotherapy methods.

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155 9:00 am I

The Promising Effects of Brazil Nut Consumption on Postprandial Satiety, Glucose and Insulin Responses in a Healthy Population

Alison Rosenstock, Nutritional Sciences (M)

The mineral selenium (Se) has exhibited a multitude of health benefits including increased antioxidant capacity, improved insulin and glucose responses, and potential elevation of mood. Yet there is limited research on Brazil nuts, the highest known food source of selenium, and whether consumption of these nuts also demonstrates these positive outcomes. The purpose of the present study was to determine the effects of Brazil nut consumption on postprandial satiety, glucose, insulin, antioxidant activity and anxiety in healthy subjects. In a crossover design with two trials, 22 healthy adults (age 25 ± 1.1y, BMI 22.3 ±0.7 kg/m2) consumed snacks of pretzels (36g, 131 kcal, 89.5 mg sodium, no Se) and isocaloric, sodium-matched Brazil nuts (20g, 383 mcg Se), separated by a 48-hour washout period. A visual analogue scale measured satiety at baseline, 20 and 40 minutes after snack consumption, while the modified anxiety scale measured anxiety at baseline and 40 minutes. Blood glucose, insulin and antioxidant levels were measured at baseline and 40 minutes post consumption. Both the Brazil nuts and pretzels increased satiety with greater satiety in Brazil nuts compared to pretzels (P=0.049) and decreased anxiety (P=0.020) from baseline to 40 min post consumption with no significant differences between the two trials. Pretzel consumption caused a significant increase in blood glucose and insulin (P<0.001) at 40 min post consumption compared to baseline, while Brazil nut consumption did not significantly increase blood glucose or insulin levels. No significant differences were found between the trials on antioxidant capacity. These data suggest that Brazil nut consumption improved postprandial satiety and stabilized glucose and insulin responses which may be beneficial in maintenance and/or prevention of diabetes and reduction in incidence of overweight and obesity. Future research should examine the relationship between Brazil nut consumption and subsequent food intake and weight gain, biomarkers of cardiovascular disease, and glucose and insulin responses in a diabetic population.

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156 9:00 am J

Inhibition of enzymatic browning during protein isolation from mealworm (Tenebrio molitor) larvae

Shruti Shertukde, Foods and Nutrition (U)

Mealworms have a great potential to serve as a sustainable protein source due to their high protein content with well-balanced amino acid profile, efficient feed conversion rate, low environmental footprint, and ability to live on organic waste. However, enzyme-catalyzed melanization of mealworm tissues occurs during the protein isolation process, which negatively impacts the appearance, functionality, digestibility, and flavor of the proteins. The objective of this study was to develop effective methods to inhibit browning of the mealworm protein extract.

Soluble proteins were extracted from mealworm larvae in 10 volumes of water in the presence and absence of 0.05% (w/v) EDTA or 0.2% (w/v) ascorbic acid by homogenization at 30,000 rpm for 30 s. Mealworm protein extracts were kept at 20°C for 60 min, and color was analyzed by a Hunter Lab colorimeter. One-way ANOVA and Tukey's honestly significant difference test at $P \leq 0.05$ was performed, for the overall analysis of variance and mean separation, respectively.

Lightness/darkness of the samples were measured by the L* value, with 100 being the lightest and 0 being the darkest. Mealworm proteins extracted in 0.2% ascorbic acid solution had constantly higher L* values than those extracted in 0.05% EDTA solution and water ($P \leq 0.05$). The addition of 0.05% of EDTA did not show appreciable inhibitory effect until 10 min. At 60 min, the L* values for both water (16.00±0.24) and 0.05% EDTA solution (33.14±1.75) extracted proteins dropped considerably ($P \leq 0.05$) from the starting L* values of each extract (69.69±1.45 and 71.49±0.26, respectively). Conversely, the L* value of mealworm proteins in 0.2% ascorbic acid solution did not vary significantly in 60 min ($P > 0.05$). The presence of ascorbic acid and EDTA resulted in less ($P \leq 0.05$) total color differences (1.30±0.32 and 42.47 ±1.41, respectively) over 60 min than mealworm protein extracts in water (57.30 ±0.05).

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These findings suggest that the presence of 0.2% ascorbic acid effectively inhibited the melanization of mealworm proteins.

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157 9:00 am K

Effect of Dried Plum on Bone Health in Men

Jonnatan Fajardo, Nutritional Sciences (M)

Currently there are 57 million Americans with low bone density or osteoporosis. For Americans 50 years old and older, one in four males will break a bone due to osteoporosis. Dried plum is the most effective fruit in both preventing and reversing bone loss. Although several animal studies have demonstrated bone protective effects of dried plum, no human study has evaluated the effect of dried plum on bone metabolism in men. Sixty-six men (50 to 79 years old) were randomly assigned to an intervention group of 100 g dried plum per day or a control group of 0 g dried plum per day for 6 months. Both groups had blood samples taken after an overnight fast at baseline, 3 months, and 6 months to asses changes in bone biomarkers. Bone mineral density (BMD) was assessed at baseline and 6 months via dual energy X-ray absorptiometry (DXA). Fifty-eight participants completed the six-month study. There were no significant changes in bone density for either group at 6 months in total body, spine, and total hip. The control group showed significantly lower bone density in the ulna compared to the dried plum group. The results of the current study suggest that daily consumption of 100 g dried plum for 6 months has modest bone protective effects in men that are somewhat similar to those observed in postmenopausal osteopenic and older osteopenic women. Longer-term studies are necessary to confirm the findings of this study as bone studies of less than one year are normally not considered optimal when measuring treatment effects on BMD.

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158 9:00 am L

Effects of dried plum on bone biomarkers in men

Danielle Gaffen, Nutritional Sciences (M)

Objectives

Osteoporosis in men is an overlooked yet increasingly important clinical problem that, historically, has not received the same degree of awareness as with women. Epidemiologic studies demonstrate that male osteoporosis contributes significantly to the burden of osteoporotic fractures, especially among the aging population. Although several studies of male animals have demonstrated bone protective effects of dried plum, no human study has evaluated the effect of dried plum on bone metabolism in men. For this purpose, we conducted a randomized controlled clinical study to test if daily inclusion of 100 g dried plum will positively influence serum markers of bone metabolism in men.

Methods

Sixty-six men (50 -79 years old) were randomly assigned to one of two treatment groups: 1) control (0 g dried plum) or; 2) 100 g dried plum with fifty-eight subjects completing the study. All groups received 500 mg calcium and 300 IU vitamin D (Shaklee Chewable Cal Mag Plus) as a daily supplement. Blood samples were collected at baseline, and after three and six months to assess biomarkers of bone turnover.

Results

Serum bone specific alkaline phosphatase (BAP) levels decreased significantly at 6 months in both control and dried plum groups. 100 g/day dried plum consumption resulted in a time-dependent reduction in serum tartrate resistant acid phosphatase-5b (TRAP5b) levels, a marker of bone resorption, at three- and six-month time intervals compared to baseline while there were no significant changes in serum TRAP5b levels of the control group. Dried plum consumption significantly decreased C-terminal collagen cross-links (CTX), another marker of bone resorption, three- and six-months compared to baseline. No changes were observed in the control group for CTX levels.

Conclusions

The results of the current study suggest that daily consumption of 100 g dried plum for 6 months has modest bone protective effects in men that are somewhat similar to those observed in postmenopausal osteopenic and older osteopenic women.

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159 9:00 am M

Physicochemical Characteristics and Proximate Composition of Select Edible Insects in Oaxaca, Mexico

Autumn Stoll, Food and Nutrition (U)

Insects can effectively convert feed to high-quality nutrients while minimally impact the environment. Entomophagy is practiced in many countries but awaits a breakthrough into the US market. Characterization of edible insect products from cultures where insect consumption is normalized can promote their utilization in the US. The goal of this project was to determine the physicochemical properties and proximate composition of select edible insect species in Oaxaca, Mexico.

Processed edible insects were acquired from local markets in Oaxaca, Mexico: chapulines (nymphs and adults of Sphenarium purpurascens and Melanoplus mexicanus grasshoppers), chicatanas (flying adults of Atta Mexicana ants), and red maguey worms (larvae of Comadia redtenbacheri moth). The insects were measured for length, breadth, thickness, mass, water activity, pH, and proximate composition. One-way ANOVA and Tukey's honestly significant difference test at $P < 0.05$ were used for the overall analysis of variance and mean separation, respectively.

The chapulines consisted of two species: S. purpurascens and M. mexicanus. M. mexicanus were the predominant species (83%) in nymph chapulines, while S. purpurascens were more abundant (65%) in adults. Length, breadth, thickness, and mass ranges of different species were 11-27 mm, 2-8 mm, 3-7 mm, and 0.1-0.4 g, respectively. All insects were subjected to dehydration and were thus low in moisture content (2.46-9.53%) and water activity (0.43-0.59) except for chapulines (36.08-40.61% moisture, aw = 0.70-0.74) because lime juice was added for flavor. The addition of lime juice also

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explained the significantly lower ($P < 0.05$) pH of chapulines (3.67-4.01) than the other insects (5.43-5.83). Chapulines also contained added salt, which resulted in a considerably higher ($P < 0.05$) ash content (11.76-16.30%) as compared to the other species (1.48-7.05%). Chapulines were low in fat (3.32-5.20%) while A. mexicana (27.43-38.00%) and C. redtenbacheri (42.71%) were lipid-rich. A. mexicana had significantly ($P < 0.05$) more carbohydrates (30.72-30.82%) than C. redtenbacheri (19.23%) and chapulines (18.72-21.84). The protein content of the insects ranged from 21.36% (C. redtenbacheri) to 27.93% (A. mexicana) as determined using a nitrogen-to-protein conversion factor of 4.76.

This study provided useful information that can facilitate the incorporation of edible insects into the American diet.

Session A-11

Poster Health and Nutrition & Clinical Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

160 9:00 am N

Assessing the Utilization of GeneXpert MTB/RIF as a Rapid Diagnostic Tool in Mbale, Uganda

Saanjh Boyani, Masters of Public Health - Health Promotion & Behavioral Science (M)

Background: Tuberculosis (TB) is among the top 10 causes of death worldwide. Uganda continues to notify an endemic TB incidence of 234 cases per 100,000 persons. Mbale is comprised of a 79% rural settlement and faced with various socio-economic disadvantages that contribute to increased rates of TB loss to follow-up and mortality. Sputum smear microscopy is widely accepted as the universal diagnosis tool for TB in multiple countries, yet its sensitivity is only 50% and this further contributes to the delay in TB diagnosis. One strategy to augment TB case finding has been the implementation of a new rapid tuberculosis diagnostic tests: GeneXpert testing.

Objective: GeneXpert is expected to increase case detection, decrease laboratory turnaround time, and improve timely initiation of TB treatment. The purpose of this study is to assess the utilization of GeneXpert among patients presenting at 5 health centers in Mable, Uganda.

Methods: A retrospective cohort study was conducted to achieve the objective of this study; clinical records were ascertained from 5 health facilities in Mbale, Uganda. Study participants included in this study were TB presumptive patients seeking care at health facilities, between the dates of 1st July 2017 to 30th September 2017. A total of 168 presumptive TB patients records were extracted from TB registrars.

Preliminary Results: GeneXpert was utilized by 31 (18.45%) of the eligible 168 cases. Of the 31 patients who utilized GeneXpert, MTB/RIF resistance was found in two (6.4%) patients. Forty-two (25%) patients were identified as HIV positive and GeneXpert was used to diagnose 27 (64.28%) HIV-positive patients. Smear microscopy was used to diagnose 89 (53%) of patients, and no diagnostic method was used for 37 (22%) of presumptive patients – indicating patient loss to follow-up. Mbale Regional Referral Hospital and Mbale Police H/C III utilized GeneXpert at the highest rates.

Conclusion: Although sites with GeneXpert machines are reported to improve timeliness and detection of TB, resource limited settings such as Mbale should be further examined with respect to their capacity for machines such as GeneXpert. The diagnostic tool was found to be underutilized and reasons for this finding should be further investigated.

161 9:00 am O

Identifying food security resources and strategies utilized by San Diego County low-income Hispanic/ Latino residents

Jacqueline Ibarra, Foods and Nutrition (U)

The purpose of this study is to explore capital and socio-ecological factors influencing household food security and diet, as perceived by community stakeholders that provide food and nutrition services to the low-income Hispanic/Latino populations in San Diego county. In exploring the perspective of community stakeholders, researchers will be able to establish approaches the community has undertaken to maintain food security and prevent food insecurity.

Data for this research will be obtained through face-to-face, semi-structured interviews with key informants at San Diego County Community stakeholder organizations that provide food, nutrition and health-related services to low-income Hispanic/Latino residents. Key informants will be contacted by invitation to participate, and continued recruitment of key informants will occur through snowball sampling. A primary investigator (PI) and three student researchers (one undergraduate, two graduate) developed a semi-structured interview guide using a capacity-based approach and the theory-based framework, the Socioecological Model. Written consent for participation will be obtained prior to the interviews. Interviews will last between 30-60 minutes, be audio recorded, and be conducted by the PI and trained student researchers. Interviews will be conducted with a combination of one student and the PI. Interview recordings will be transcribed and translated verbatim, coded, and analyzed in NVivo 12. The PI and student researchers will review and discuss initial transcripts to identify potential emerging themes and codes from which to create a preliminary codebook. The researchers will then iteratively code the transcriptions and routinely meet to refine the codebook and highlight emerging themes using thematic content analysis. Recruitment of key informants will end when theoretical saturation is reached-- no new information is being obtained.

Researchers expect to identify multi-level factors facilitating access to food and promoting healthy diet among low-income Hispanic/Latino households in San Diego county.

In exploring the perspective of key informants at community stakeholder organizations, researchers will be able to identify

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approaches the community has undertaken to promote food security and healthy diets, while also distinguishing ways to potentially integrate additional strategies into existing programs.

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162 9:00 am P

Examining Disparities of Depressive Distress Among LGBTQ Youth Before and After the 2016 U.S. Presidential Election

Adrian Marcos, Interdisciplinary Studies in Three Departments, Biology, English, Religious Studies (U)

Social and political climates affect the psychological health of populations. For example, research indicates that LGBTQ people living in states and communities with more progressive political climates and lower levels of LGBTQ-related stigma have better psychological health than their peers living in areas with more conservative political climates and higher levels of LGBTQ-related stigma. Given this research, we hypothesize that the self-reported psychological health of LGBTQ adolescents will be better during years when Obama was president compared to when Trump was president. To test this hypothesis, the current study will compare trends in LGBTQ disparities in depressive distress among adolescent surveyed prior to the 2016 U.S. Presidential election (school years 2014-15 and 2015-16) to those surveyed after the 2016 election (school year 2017-18) using data from the California Healthy Kids Survey. Bivariate and multivariable logistic regression adjusting for potential confounding by sociodemographic factors (e.g., age, gender, etc.) will be used to test the study hypothesis. This research may be useful in drawing public attention to the mental health of California's LGBTQ youth and spur the creation of programs and policies that better aid these young people.

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163 9:00 am Q

The Quality of Care Delivery For Patients Living With Alzheimer's Disease and Related Dementias (ADRD) Who Are Diagnosed With Cancer: a Systematic Review

Britney Prince, Health Management & Policy (M)

BACKGROUND:

Quality outcomes are a major public health issue within the healthcare system in the United States. Of particular concern are the varying results of patients living with Alzheimer's Disease and Related Disorder (ADRD) who are then diagnosed with cancer. The goal of this review is to assess the state of the literature in the quality of care delivery related to patients with existing ADRD and are then diagnosed with cancer versus patients without ADRD and cancer.

METHODS:

After applying inclusion/exclusion criteria for timeliness we included abstracts since 2000 when major clinical trials initiatives for ADRD were launching. Using PRISMA guidelines, we will develop MeSH terms to identify and retrieve titles and abstracts relevant to the study. Then, a thorough assessment of each title and abstract using pre-established criteria will be conducted to reduce the overall pool of titles to those that we will review for full-text analysis.

EXPECTED RESULTS:

We expect to find significant disparities in the quality of care delivered to patients with ADRD and cancer versus the general cancer patient population due to communication, provider practice behavior, and other structural factors. Additional barriers may be exacerbated by poor care coordination and access barriers among vulnerable populations such as minority and much older adults.

SUMMARY:

We hope to use these findings to inform conceptual frameworks to analyze large data sets like the NCI Surveillance, Epidemiology and End Results (SEER) linked to the Medicare database.

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164 9:00 am R

Disparity of Mobility Resources for People with Disabilities in Oaxaca, Mexico

Noelle Simpson, Master in Public Health and Master in Latin American Studies (M)

With Tinker Grant funding, the goal of this preliminary research was to i.) characterize mobility resource disparity in rural and peri-urban spaces in Mexico, and ii.) establish contacts within the wheelchair provision industry in Mexico for future research. This preliminary research employed qualitative methodologies involving motivational interviewing techniques of wheelchair provision professionals, wheelchair users and health institutions regarding their professional capacity to provide wheelchairs and other mobility devices to people with disabilities (PWDs). Interviews were conducted within the community with a diverse group of wheelchair professionals including: a representative from Desarollo Integral de La Familia (DIF), a physician and nurse from Instituto Mexicano del Seguro Social (IMSS), wheelchair users and a caregiver from a rural community. A referral pathway on how individuals acquire a wheelchair from urban and rural environments was established. Overall, more research is required regarding the provision of health resources for PWDs Mexico. Accessibility challenges for PWDs are prevalent in rural Mexico and more immersive ethnographic research is required to provide contextual understandings of the inequity that exists within this target population.

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165 9:00 am S

Gender and Racial Disparities in Lung Cancer in Never-Smokers: Asian Women

Dania Meza Acosta, Biology (U)

Background/ Purpose:

Smoking is well established as a contributing cause of many cases of lung cancer. Women, and Asian women in particular,

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are at greater risk for lung cancer than men and non-Asians who have never smoked. This literature review analyzed factors that help explain lung cancer incidence in Asian non-smoking women.

Methods:

A literature review was conducted using the following databases: PsycINFO, PubMed and CINAHL. Key words included: Asian women; lung cancer; smokers; non-smokers; racial disparities; incidence; and genetic.

Results/ Findings:

Among Asians, the patients that have never smoked account for 30% of all lung cancer patients, and of those, more than 50% are women. Rates of lung cancer in non-smokers are highest for women in Eastern Asia, versus in Asian American women. Studies have identified genetics as an important factor underlying the high proportion of lung cancers in non-smoking Asian women. Also, environmental exposure has been identified as a contributor to this disparity in lung cancer in non-smoking Asian women.

Discussion:

This review found that genetic and environmental factors contribute to the high lung cancer incidence in Asian non-smoking women. However, the exact factors are not well understood. Lung cancer education and encouragement to screen are needed for Asian women who are non-smokers and do not realize they are at risk.

Session A-12

Poster Behavior and Social Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

166 9:00 am T

White matter structure in middle-aged adults with autism spectrum disorders

Adam Schadler, Masters of Arts in Psychology (M)

Introduction: Autism spectrum disorders (ASDs) are characterized by behavioral, social, and communicative deficits that have a wide range of expression and severity across individuals. Diffusion weighted imaging (DWI), an MRI technique that allows the study of white matter structure in vivo, suggests atypical timing of white matter development in children and adolescents with ASDs. Although ASDs are lifespan disorders, little is known about white matter changes during later adulthood, when neurotypical adults are at increased risk of white matter decline. To address this knowledge gap, we examined 14 major white matter tracts, reconstructed from DWI data collected from adults with ASD and typical control (TC) participants aged 40-65 years.

Methods: Magnetic resonance imaging data were collected from 37 participants: 16 with ASDs (mean±s.d.: 50.88±6.28 years) and 21 TC (50.57±6.59 years). Tractography was performed using TRACULA, a program that combines inputs from both anatomical and diffusion scans (using Freesurfer and FSL software respectively) in order to automatically estimate probable locations of major white matter tracts. Tract development and organization were measured by calculating volume and average Fractional Anisotropy (FA) —a DWI-derived, normalized measure that describes directional coherence of local water diffusion— for each tract. Multivariate analysis of covariance (MANCOVA) was used to test for group, age, and interaction effects. The test of tract volume also covaried for total brain volume

Results: For average FA, a significant negative age effect was found only for the left cingulate branch of the cingulum (CCG, $p=.026$, $\eta 2=.146$), when collapsing across diagnosis. Although no significant diagnosis or interaction effects were observed, medium effect sizes (ASD>TC) were found for the right superior longitudinal fasciculus-parietal branch (SLFp, $\eta 2=0.052$) and the left uncinate (UNC, $\eta 2=.057$). No significant effects were found for tract volume.

Conclusion: While previous studies have suggested atypical white matter development in children and adolescents with ASDs, our preliminary analyses could not detect significant evidence suggesting a similar trend in older adults with ASDs. However, absence of main effects of group must be interpreted with caution in view of the small size of the preliminary sample and subsequent limited power.

167 9:00 am U

Balance performance in adults with autism spectrum disorder compared to typically developing adults

Chantal Chaaban, Psychology (U)

Background: Sensorimotor impairment is often seen in children with Autism Spectrum Disorder (ASD) as one of the earliest warning signs of atypical development. Postural sway, a measure of balance while standing, is reported to be increased in children and adolescents with ASD compared to typically developing (TD) children, especially with increased task difficulty (e.g. standing on one foot). At the same time, balance often declines during normal aging, leading to increased injury in adults. Little is known about the combined effects of ASD and aging, which could lead to new risk factors.

Objective: To test whether balance is altered in older adults with ASD and whether task difficulty differentially affects performance.

Method: Balance data were collected from 55 participants (40–64 years), 19 with ASD and 36 TD controls. Groups were matched on age and non-verbal IQ. Participants performed 4 balance tasks while standing on a BTrackS Balance Plate: standing on both feet with eyes open (BF-EO), on one foot with eyes open (OF-EO), on both feet with eyes closed (BF-EO), and one foot with eyes closed (OF-EC). Standing on one foot or with eyes closed was considered to add difficulty. Three 20-second trials were administered per task, and mean path length, a measure of postural sway, was averaged within task.

Results: A 2(group) by 2(stance interaction) repeated measures analysis of variance was run separately for the Eyes Open

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

and Eyes Closed conditions. Postural sway increased with task (OF>BF) in both conditions (ps<.001). There were no significant group or interaction effects in the EC condition, (F(1,39)=.26, p=.616). In the EO condition, the main effect of group approached significance (F(1,42)=3.73, p=.060), but no interaction was found (F(1,42)=2.94, p=.094).

Discussion: Unexpectedly, the current data do not support balance deficits in adults with ASD adults, even with increased task difficulty. In the context of balance impairments reported on the same task in adolescents, this might be seen as a sign of balance improvements during young adulthood. However, the limited sample size and the trend toward a main effect of group in the EO condition argue for caution on this interpretation.

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168 9:00 am V

U-fiber connections between primary and somatosensory cortex in older adults with ASDs

Ashley Baker, Psychology (U)

Autism spectrum disorders (ASDs) are characterized by deficits in social skills and communication and the presence of restricted and repetitive behaviors. Many individuals with ASDs also show motor deficits. A recent study of young adults with ASDs used diffusion weighted imaging (DWI) to examine interconnectivity between the primary motor (M1) and primary somatosensory (S1) cortices. Axonal connections between M1 and S1, which are U-shaped fibers, allow these regions to interact, conveying sensory feedback information vital for motor control. The study found that participants with ASD had lower measures of fractional anisotropy (FA) and higher measures of mean diffusivity (MD) within U-fibers. The current study aims to confirm and extend these findings with a sample of older adults with ASD, aged 40-65 years. It was hypothesized that adults with ASD would perform more poorly on motor tasks and show compromised microstructure in DTI measures such as FA, MD, radial diffusivity (RD) and axial diffusivity (AD).

Diffusion weighted imaging data from 19 participants with ASD and 24 NT participants (40-65 years) were included. U-fiber tracts connecting homologous ipsilateral M1 and S1 regions of the hand were identified using Trackvis software. The volume, FA, MD, RD, and AD of each tract were also measured. Motor skills were quantified using the Bruininks Motor Ability Test (BMAT). Independent samples t-tests were used to compare ASD and NT groups. We also ran correlations between U-fiber tract measures and the BMAT scores for each group

No significant group effects were found for U-fiber tracts. However, the ASD group scored significantly lower on the fine motor, manual dexterity, coordination, and strength and flexibility BMAT tests. Additionally, in the ASD group, lower BMAT standard score was associated with higher FA and lower MD and RD of the non-dominant hand tract.

Preliminary analyses did not reveal U-fiber differences between ASD and NT subjects. However, the BMAT scores and correlation are consistent with previous findings of motor deficits in ASD into late adulthood. Null findings may also relate to the small size of the preliminary sample included in this study. Relationships between BMAT and U-fiber tracts will also be further examined.

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169 9:00 am W

Associations between couple conflict, fetal reactivity, and infant outcomes

Lena Barbakh, Biology and Child and Family Development (U)

Background. Research indicates that maternal stress during pregnancy has a major impact on the outcome of the fetal and child development; however, marital discord's effect on prenatal development has been understudied (Fields, 2002).

Objectives and Hypotheses. The objective of this research is to examine associations between couple conflict, fetal heart rate reactivity (increase or decrease in heart rate in response to parental conflict), and later infant temperament. It hypothesized that more negative communication during discussions of disagreements (conflict) will predict more difficult temperaments when infants are 4-months-old. An association is also expected between increases in fetal heart rate in response to parental conflict and later infant temperament. Lastly, it is hypothesized that fetal heart rate reactivity will mediate an association between negativity in couple conflict and later infant temperament.

Methods. This research examined 13 couples with healthy pregnancies from the third trimester of pregnancy through 4-months post birth. Negativity during conflict and fetal heart rate reactivity were assed during the third trimester of pregnancy, and infant temperament was assessed when infants were 4-months old. Negativity during marital conflict was also assessed using a global affect observational coding of the marital conflict situation based on the Specific Affect Coding System, with higher scores being associated with more negativity. Fetal heart rate was measured using a portable 2-D ultrasound machine to measure heart rate both before and immediately after the conflict discussion. Heart rate reactivity was calculated by subtracting pre-conflict heart rate from the pre-conflict measure (increase or decrease in heart rate). pre-conflict heart rate, and post-conflict heart rates). Temperament of the infant was measures through both observational coding of infant affect and over-stimulation, and through maternal report of temperament using the Infant Characteristics Questionnaire (ICQ; Bates, 1989), which has demonstrated reliability and validity.

Results. Preliminary analyses indicate that negativity during parent conflict is associated with an increase in fetal heart rate post conflict.

Conclusion. Negativity in the couple conflict appears to be a risk factor for fetal and infant development. This has implications for promoting positive conflict resolution during pregnancy.

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

170 9:00 am X

Behavioral Sensitization to Methylphenidate in C57BL/6J x FVB/NJ F1 Hybrid Mice with Prenatal Alcohol Exposure

Alicia Green, Psychology (U)

Introduction: Alcohol is a teratogen that can negatively impact prenatal development, and prenatal alcohol exposure (PAE) can result in a variety of physical and neurobehavioral deficits. Fetal Alcohol Spectrum Disorders (FASD) is the term used to refer the range of outcomes associated with PAE. Children with FASD often exhibit ADHD-like symptoms and may be pharmacologically treated with psychostimulants like methylphenidate (MPH). However, the few studies evaluating the effectiveness of methylphenidate treatment in this population have been mixed. We used a mouse model of FASD to examine locomotor responses to repeated MPH treatment. We hypothesize that mice with PAE will sensitize to low dose methylphenidate treatment.

Method: C57BL/6J x FVB/NJ F1 hybrid mice were exposed to alcohol or a control fluid from gestational days 7–16 (GD 7-16) using the Drinking in the Dark paradigm. F2 offspring underwent behavioral testing on postnatal days 35-43. Offspring were administered an intraperitoneal injection of saline on days 1-2, followed by either saline, 0.5, 1.0, or 2.0 mg/kg MPH every-other-day during days 3-9. Locomotor activity was measured in an open field on days 1-3 and 9. A repeated measure analysis of variance (ANOVA) was used to analyze the data with day as the within-subjects variable, prenatal treatment group and MPH dose as the between-subjects variables, and total distance traveled in 10 minutes at the dependent variable.

Results: All mice showed increased locomotor activity to MPH treatment. However, the PAE mice developed behavioral sensitization with repeated 2.0 mg/kg MPH treatment, but not with repeated 1.0 or 0.5 mg/kg treatment. Control mice did not develop behavioral sensitization to any dose.

Conclusion: This study indicates that repeated low-dose MPH treatment can lead to sensitization in PAE mice, although this is not seen in control mice. These results are important as they may have clinical relevance for children with PAE receiving MPH treatment. Further research is needed to continue to develop effective treatment options for children with PAE.

171 9:00 am Y

Creating a Psycho-Social Profile of School Shooters by Identifying Correlations

Nikolas Leon, Psychology (U)

In recent years school shootings and violence has taken center stage in the news and social media. Beginning with Columbine and ending with Stoneman Douglas, as a society we have been left with more questions than answers. Profilers and mental health professionals have attempted to identify differences and similarities with each perpetrator and their unique situation. This study will also attempt to find correlations by identifying and studying 15 school shooters throughout the span of the last 20 years. This study will explore each of their conditions by focusing on each individual's unique situation. This will be accomplished by focusing on 7 domains that include: religion, upbringing, family dynamics, school bullying, access to weapons, mental health disorders/treatment, and their fascination with violence & weapons. This qualitative research will be completed by comparing and contrasting each subject, emphasizing each of the 7 domains. By doing so the research hopes to pinpoint identifiable traits and characteristics that can later be used to create a profile, thus implementing early intervention techniques.

Session A-13

Poster Behavior and Social Sciences 4
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

172 9:00 am Z

Parenting Style, Adolescent Irritability and the Potential Impact of Environmental Factors

Rebeccah Glisson, Psychology (U)

Depression is a highly prevalent and debilitating disorder that has been shown to run in families. Previous research indicates that depression transmission occurs through both biological and environmental pathways. Irritability is a highly interpersonal symptom and a core diagnostic criterion of pediatric depression; parenting behaviors may be particularly important in the development and maintenance of irritability symptoms in at-risk youth. The current study hypothesized that a relation would be found between parenting styles and perceived child irritability in a sample of adolescents at personal and familial risk for depression.

Participants were 316 adolescents (M=14.79 years, SD=1.35; 59% female; 24% racial and/or ethnic minority), enrolled in a randomized trial of a cognitive-behavioral depression prevention program. At baseline, adolescents and consenting caregivers completed the Child Report of Parent Behavior Inventory (CRPBI) to assess parental acceptance, monitoring, and psychological control, with higher scores indicating greater use of that style. Baseline irritability was measured by a 7-item factor identified in the parent-reported Conflict Behavior Questionnaire (CBQ), with higher scores indicating greater adolescent interpersonal irritability.

Univariate linear regressions were run to evaluate the relation between each parenting domain and adolescent levels of interpersonal irritability. Higher levels of parental acceptance (tparent- report[308]=-6.83, p<.001; tyouth-report[272]=-4.38, p<.001) and monitoring (tparent-report[308]=-2.47, p=.014; tyouth-report[272]=-2.25, p=.025) were significantly related to lower levels of adolescent interpersonal irritability scores. Higher levels of parental psychological control (tparent-report[308]=7.22, p<.001; tyouth-report[272]=6.59, p<.001)

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were significantly related to higher levels of interpersonal irritability. In multivariate models by respondent that included all three parenting domains, parent-reported acceptance and psychological control and youth-reported psychological control remained significantly related to adolescent irritability ($p<.05$). Neither current parental depression nor socioeconomic status moderated the identified relations between parenting style and adolescent interpersonal irritability ($ps>.05$).

Results revealed significant relations between parenting behaviors and parents' reports of adolescent interpersonal irritability. Given the cross-sectional nature of these data, however, we cannot determine the direction of this relation. Randomized trials testing the effect of parent training on adolescents' levels of irritability are needed to address the question of directionality.

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173 9:00 am AA

Associations between Irritability and Neuropsychological Correlates of Attention in Adolescents

Michael Liuzzi, Psychology (M)

Background: Irritability, defined as a lowered threshold for anger, is prevalent in both typically and atypically developing populations and is present in internalizing and externalizing disorders, including in anxiety. Evidence suggests that adolescents with higher levels of irritability and anxiety have an attentional bias toward threatening stimuli. However, little is known about the underlying executive attention deficits that may contribute to this phenomenon. In the present study, we investigate attention and response inhibition, and its neural correlates, in a sample of adolescents with varying levels of irritability.

Hypothesis: We predict that higher levels of irritability will be associated with poorer attention and response inhibition. Additionally,we expectthat while engaging in a task probing attention and response inhibition, participants with higher levels of irritability will have hypoactivation in attention-related regions of the brain, including the prefrontal cortex and posterior cingulate, compared to those with lower levels of irritability.

Methods:Our sample included adolescents (N=49, mean age=14.0, SD=1.89) recruited from the community. Parents of the participating adolescents completed the Affective Reactivity Index (ARI) questionnaire rating their child's irritability. All participants completed the NIH Toolbox Flanker Attention Task on an iPad. This task is specifically designed to probe attention and response inhibition. A subset of our sample (n=16) also completed a flanker task while undergoing fMRI acquisition.

Results: The sample exhibited distributions of irritability comparable to other community samples (ARI, range 1-10, mean=1.96, SD=2.28). Preliminary analyses yielded no significant correlation between attention/response inhibition and parent-reported irritability scores (r=-.051). Analyses investigating attention/response inhibition-related neural biomarkers of irritability are currently underway.

Conclusions: No relationship was found between irritability and performance on a neuropsychological task of attention/response inhibition. However, even without these behavioral manifestations, irritability may be related to differences in the recruitment of neural attention networks, and will therefore be analyzed in a subset of the original sample (n=16).

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174 9:00 am BB

Examining Gender Differences of Error-Related Negativity in Adolescents

Valery Quinonez, Psychology (U)

The error-related negativity (ERN) is an event-related potential (ERP) component, characterized as a negative deflection that peaks at approximately 50 ms after a response, that is elicited after making a mistake (Falkenstein et al, 1991, Gehrig et al, 1993). Those with anxiety disorders tend to have ERNs that are higher than the typical population; in fact, ERN is widely acknowledged as an endophenotype of anxiety disorders (Olvet & Hajcak, 2008; Weinberg et al, 2010; Meyer et al, 2018). Regarding sex, women are more than two times as likely as men to develop an anxiety disorder (Wittchen, Nelson, & Lachner, 1998). However, previous studies have found that among adults, men have a significantly higher ERN (Fischer et al., 2016; Larson, South, & Clayson, 2011). To the best of our knowledge, sex differences in ERN during adolescence have not been evaluated before. Considering that ERN may change with age (Moser 2017), we wanted to examine if the results seen in adults present similarly in adolescents. We examined the ERN of 100 adolescent females and 120 adolescent males between the ages of 11-14. The participant's ERN was recorded from Fz during a flanker task designed to elicit errors (Hajcak, 2012). We found that females had higher ERNs ($M = -2.84$, $SD = 4.96$) than males ($M = -0.94$, $SD = 6.03$); $t(218)= -2.57$, $p= 0.01$. This is consistent with the research that indicates girls have higher rates of anxiety (Beesdo, Knappe, & Pine, 2009); however, this differs from the research evaluating gender differences in ERN in adults (Fischer et al., 2016; Larson, South, & Clayson, 2011). One explanation for this difference may be that a lower ERN in children is associated with higher reported anxiety, as found in previous studies (Torpey et al., 2013). Additionally, Moser (2017) suggests that puberty and sex hormones may contribute to the difference in rates of anxiety between men and women. These differences start appearing in early childhood and they increase with age (Beesdo, Knappe, & Pine, 2009). Evaluating ERN from childhood to adolescence may help identify the turning point when these gender differences become apparent.

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175 9:00 am CC

Relationship of Helping Attitudes and Personality Traits in College Students

Tareen Mekany, Psychology (U)

Helping attitudes in college students were examined using various questionnaires, inventories, and scale measures. These

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self-reported measures were then compared to an observed helpfulness rubric. 33 undergraduate students at San Diego State University were specifically tested on their reactivity and willingness to help in a situation set forth by the experimenters. Their responses were recorded by the experimenter on a modified gLMS for helpfulness, and then self-reported after the fact. The participants filled out the Big-Five personality inventory, the Helpfulness Attitudes Scale, and a demographics survey. This study was done after relevant research was found on the topic suggesting that empathetic concern has been sharply declining in American college students (Konrath et. al, 2010). Before conducting the study, it was hypothesized that people who engage in helping behaviors may have a specific pattern of personality traits. This particular manuscript focuses on the 5 main personality traits: extraversion, agreeableness, neuroticism, conscientiousness, and openness. Data revealed that those who were higher in conscientiousness were less likely to help.

176 9:00 am DD

Motivational effects of science stereotypes on first-generation college freshmen in science

Lauren McLeese, Psychology (U)

Scientists are often stereotyped as having negative social traits, including being socially disconnected, unskilled in relationships, and have few other interests other than their work (Margolis & Fisher, 2002; Schott & Selwyn, 2000). Although these stereotypes are certainly not true of all (or even most) scientists, awareness and endorsement of these negative social stereotypes can negatively affect academic and career science aspirations for those who are underrepresented in science (Cheryan et al., 2013). The purpose of the study is to examine the effects of science stereotypes on student motivation at the start of college – before many students, especially first-generation students (FG, i.e., the first in their families to go to college), have the opportunity to interact with their science faculty. Specifically, we use survey data (N = 291 undergraduate college students; 45.7% FG, 65.7% female) to examine the relationship between first-semester freshmen students' endorsement of science stereotypes and their expectations for psychological involvement in their science classes. Although FG students reported the same mean levels of scientist stereotype endorsement as continuing generation (CG) students, the motivational effects of these beliefs were different. Multiple regression results revealed that for FG, but not CG students, greater endorsement of scientist stereotypes (i.e., scientists are socially isolated and disconnected people) predicted lower expectations of psychological involvement in their science classes, even the start of freshmen year ($p = .022$).These initial differences in expectations mattered for end-of semester outcomes. Correlation analyses demonstrated that students with higher initial expectations of psychological involvement reported higher end-of-semester engagement, higher science identity, and lower belonging concerns ($ps < .05$) Socially created beliefs such as stereotypes about social traits of scientists can impact students' motivation. Factors which resist the endorsement of such stereotypes should be investigated in future research in order to maximize positive influence of students' experiences in science classes.

Session A-14

Poster Engineering and Computer Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

177 9:00 am EE

Wildfire Detection using Advanced Optical Communication in Small Satellites

Karl Parks, Aerospace Engineering (U)

The advancement and miniaturization of technology has dramatically lowered the entry level of satellite designs to entities like private companies, enthusiast organizations, and universities. However, fast communication of recorded data from a satellite to a ground station is an extremely limiting factor. Sending data and images of rapid-changing earth traits, such as wildfires, in a reasonable period of time can greatly assist mankind. Early tests have shown that laser communication systems can transmit data 50 to 100 times faster than radio frequency transmissions. Traditional laser communications have been utilized in satellites with larger airframes, but only as recently as August 2018 has this been achieved in smaller CubeSat class satellites. Due to the power, mass, and size constraints, utilizing ground-based laser systems is preferable to hard mounted laser communications. Through a process known as asymmetric laser communication, ground-based lasers are reflected off of a modulating retroreflector. In our research, we demonstrate the feasibility of asymmetric laser communications within CubeSat class satellites by designing and building a working satellite. Utilizing our satellite's higher data transmission rate, the U.S. Forest Service and California firefighter departments will be able to receive critical information about wildfire outbreaks and status changes dramatically faster than satellites using traditional radio frequency transmissions.

178 9:00 am FF

Post-fire Peak Flow Estimates in Southern California

Brent Wilder, Civil Engineering, Water Resources Engineering (M)

Wildfires can significantly impact land cover, hydrologic response, and land-atmosphere interactions. Recently, human-ignited fires, development, climate change, and large fuel loads have increased fire hazards in California. For example, the Holy Fire (August 2018) burned 23,126 acres in Orange County and Riverside County, and the Woolsey and Hill Fire (November 2018) burned 96,949 acres in Los Angeles County and Ventura County in California. These large urban-fringe wildfires resulted in substantial loss of life and property. Winter storms often follow wildfire seasons, which

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have the potential to cause flooding and debris flows in the burned regions. To address these concerns, a Watershed Emergency Response Team (WERT) is assembled, comprising of hydrologists, civil engineers, geologists, and geographic information system (GIS) specialists. The team identifies areas at risk to post-fire hazards and recommends mitigation solutions. Models that estimate post-fire peak flows, debris flow potential, and erosion rates are used to guide these recommendations. However, the performance of many of the applied hydrologic models has not been well documented and there is often a lack of consistency in post-fire hydrologic assessments. Thus, as wildfire frequency and severity increase across the western United States, there is an urgent need to accurately predict post-fire peak flow.

This study focuses on the 2003 Old Fire in San Bernardino Mountains (Devil Canyon) to evaluate the performance of the Rowe Countryman and Storey (RCS) methodology to predict post-fire peak streamflow. This work will model the 2-,5-, and 10-year streamflow events (Q2-Q10) after a fire using the 1949 RCS method and 1954 RCS method. Historical peak streamflow records are available from the United States Geological Survey (USGS) for Devil Canyon. The Weibull method used the annual peak streamflow to estimate the probability and peak flow, which was used to validate the 1949 and 1954 model predictions. This preliminary analysis serves as a pilot case study that will be expanded to watersheds throughout southern California. Ultimately, this research will provide a better understanding of the performance of RCS and improve certainty in tools for post-fire peak streamflow prediction for watershed emergency response teams and managers.

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179 9:00 am GG

Evaluating the Chemical Character of Organic Matter in an Urban Creek Impacted by a Fire

Denise Garcia, Environmental Engineering (U)

Dissolved organic matter (DOM) in aquatic systems is heterogeneous, and different types of organic matter have different chemical reactivity and affinity for mercury (Hg), a toxic trace element. During fires, mercury is released into the atmosphere, and may be re-deposited on terrestrial landscape, where anoxic processes can transform Hg into methylmercury, a form of Hg that bioaccumulates in the environment. Burning of soil organic matter also results in transformations of the pool of organic matter that is transported into waterways during storm events. These changes may have important implication for Hg mobilization, especially in urban areas where the impacts of fire have been less thoroughly studied. The goal of this study is to compare the chemical quality of DOM in an urban creek, Alvarado Creek, near San Diego State University, at a site that experienced burning during the Del Cerro fire of June 2018 to that of an unburned site. Results from samples collected before, after, and during the first major storm in November 2018 indicated that the increase in dissolved organic carbon (DOC) concentrations at the burned site, from 11.0 mg/L (at the beginning of the storm) to 30.4 (midway through the storm) was much higher than in the unburned, upstream site, where DOC concentration only increased up to 16.6 mg/L during the storm. Similarly, the increase in total dissolved nitrogen concentrations were higher at the burned site, from approximately 0.8 mg/L at the start of the storm to 3.2 mg/L midway through the storm, reflecting the flushing of nutrient-laden soils, compared to the unburned site, which only increased up to 2.1 mg/L. Our chemical characterization of DOM using fluorescence spectroscopy and ultraviolet to visible absorbance provides additional information regarding the chemical qualities (freshness, aromaticity, and humic nature) of DOM in the water column during a storm event. The relationship between Hg, methylmercury, and DOM concentrations are important in order to predict the amount of mercury that may be transported into urban waterways.

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180 9:00 am HH

Heat Induced Polymeric Stabilization of Clays

Jonathan Cabrera, Civil Engineering (U)

A novel technology to stabilize clay soils upon water attack is described. Non-swelling Kaolinite and swelling Bentonite clay masses are mixed with added thermoplastic, rotund polymer particles, molded into cylindrical bricks, and subjected to an array of treatments. The treatments involve heating (to induce melting of the polymeric particles) or lack thereof, and brick submersion in water. The tensile strengths of treated bricks are measured across a spectrum of polymer contents. Results for heat-treated bricks indicate an increase in submersed strength when the polymer content by volume of clay increases. SEM images suggest that such increase is due to the heat treatment-induced seepage of the molten polymer either into petal-like aggregates (low polymer contents) or by a coalesced polymer structure (high polymer contents), both of which render increased strength by interruption of fractures across the clay fabric. This newly developed technique creates a baseline for improving the engineering properties of clays with polymer additives, and to a greater understanding of the capricious nature of clays when additives, especially water, are introduced.

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181 9:00 am II

Calibration and Application of a Digital Camera for Ratio Pyrometry in the Narrow Channel Apparatus

Michael Berry, Mechanical Engineering (M)

The Combustion and Solar Energy Laboratory at SDSU has developed a successful microgravity combustion test chamber, the Narrow Channel Apparatus (NCA). Although many tests have been performed to measure flame spread rate, no tests to date have successfully measured conditions inside the NCA, notably temperature. Attempts to measure temperature with thermocouples have either been ineffective or detrimental to the test. As a noninvasive solution to measuring soot or gas phase temperature inside the NCA the method of ratio or two-color pyrometry was applied.

Building on previous academic works an unmodified consumer

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grade digital camera, a Canon EOS 5D Mark III, was calibrated to measure soot temperature inside the NCA. Calibration of the camera was done with a blackbody furnace operating between 800 and 1050 C. Unprocessed images of the blackbody were divided into red, green, and blue signal components corresponding to the three-color filter arrays in front of the camera sensor. Since the temperature and emissivity of the blackbody are known a lookup table was created correlating temperature with a signal ratio of any of the two-color pairs. A similar approach assuming soot emissivity to be a function of wavelength was used to create a soot temperature lookup table based on the blackbody results. The soot lookup table could then be applied to any unprocessed flame images taken by the calibrated camera to determine temperature within the sooty region of flames on a per pixel basis.

182 9:00 am JJ

Post-Fire Effects on Turbidity in an Urban Environment

Kevin O'Marah, Civil Engineering (U)

Turbidity is an important parameter in water quality, which approximates the presence of suspended particulates in water. High turbidity can decrease the amount of light passing through water, which can impact the photosynthetic activity of plants and algae, decreasing the concentration of oxygen. After a wildfire, turbidity generally increases due to increased surface water and sedimentation. However, less is known about the impact of a fire in urban areas on turbidity and the response over time. This research focuses on Alvarado Creek, a tributary of the San Diego River in California, which was burned by a brush fire in June 2018. Continuous data were collected and analyzed throughout the 2018-2019 storm season. Measurements of turbidity, water depth, conductivity, dissolved oxygen, and pH were measured with a Hydrolab HL4 sensor approximately every 20 minutes and consolidated into hourly or daily means for analysis. This data will be compared to other relevant post-fire studies, computer models, and regional limits. This research also aims to identify other sources that could alter turbidity and affect overall water quality. Bare soil percentage, changes in hydrogeomorphology, and soil infiltration were also observed and used to estimate the soil erosion potential, which may be related to increases in turbidity. The turbidity prior to the storm season was approximately 15 NTU, the pH was approximately 8, specific conductivity was 3 mS/cm, the depth was approximately 0.8 feet where the measurements were being taken, and the dissolved oxygen ranged from 7 to 11 mg/L. This research will provide a better understanding of the temporal patterns of turbidity in post-fire urban environments.

Session A-15

Poster Physical and Mathematical Sciences 2
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

183 9:00 am KK

Modeling Avian Influenza Dynamics with Multiple Viral Strains Under Periodic Environmental Conditions

Jillian Kiefer, Applied Mathematics (U)

Avian influenza (AI) viruses are most commonly found among wild aquatic birds and exist in varying pathogenic strains that can potentially pose a serious threat if the novel strain is transmitted to humans. Understanding AI dynamics among aquatic birds may be useful to predict how cross-species infection will affect humans and what countermeasures can be implemented to prevent a serious outbreak. In the indirect transmission cycle of AI, infected wild birds shed the AI virus into aquatic environments, which play a crucial role in the transmission of these outside viruses to new susceptible birds, since the viral persistence in water is highly sensitive to environmental conditions, such as seasonally varying temperature. In this study, we develop mathematical models describing the dynamics of two different strains of the AI virus under periodic environmental conditions. Using our models, we identify the environmental conditions in which a dominant strain may be surmounted by its subordinate strain. Our results show that along with virus fitness, environmental selection pressure can play an important role in the persistence of a particular AI strain.

184 9:00 am LL

Role of immune status of virus-source partners on the transmission dynamics of HIV epidemics

Angelica Bloomquist, Applied Mathematics (M)

With over 36 million people currently living with the virus and approximately 1.8 million new infections per year, the HIV epidemic continues to be a devastating issue worldwide. Since there is no cure for HIV, causing the lifelong persistence of the virus in infected individuals, it is crucial to accurately quantify between-hosts transmission dynamics in a community in order to devise proper prevention and control measures. In particular, a role of immune status of source partners should be considered while evaluating a risk of infection suggested by experimental studies in which the immune status, primarily antibody levels, of source partners was found to have a significant impact on establishing infection in a new host. In this study, we developed a novel mathematical model of within-host HIV dynamics incorporating the effects of antibody levels of the source partners. Using this probability of infection accurately computed from our within-host model, we also developed a between-hosts model to describe transmission

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

dynamics in a population. Linking these models of two different scales, we thoroughly evaluate the influence of within-host dynamics on the between-hosts spread of HIV within a community.

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185 9:00 am MM

Modeling the Effects of Drugs of Abuse on HIV Infections with Two Viral Species

Peter Uhl, Computational Science (D)

Injection drug use is one of the greatest risk factors associated with contracting
human immunodeficiency virus (HIV), and drug abusers infected with HIV suffer from
a higher viral load and rapid pathogenesis. Replication of HIV may result in a large
number of mutant viruses that can escape recognition of the host's immune response.
Experimental results have shown that the presence of morphine can decrease the viral
mutation rate and cellular immune responses. In this study, we present a mathematical
model to determine if the decrease in mutation and cellular immune response in the
presence of morphine can account for the increased viral load. Our model describes the dynamics of two viral species, a wild-type and a mutant, and shows that under morphine conditioning the morphine altered mutation rate and cellular immune response can allow the wild-type virus to out compete the mutant
resulting in a higher set point viral load. Analysis of the basic reproduction number
of the virus shows that the dominant species can be determined by a threshold morphine
concentration, with the mutant dominating below the threshold and the wild-type
dominating above. Using mathematical analysis and numerical simulations of our model, we evaluate how morphine conditioning impacts the viral load and the switch between the two viral species.

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186 9:00 am NN

Use of Viral Dynamics Model in a Machine Learning Framework for Predicting Resting CD4+ T Cell Reservoirs of HIV-1

Kyle Lee, Statistics (M)

Human immunodeficiency virus (HIV) is a retrovirus that compromises a person's immune system by diminishing the number of CD4+ T-cells available to fight foreign bodies. Despite successes of antiretroviral therapies on suppressing the viral load in HIV patients, these treatments are unable to eradicate the infection. The potential obstacle to HIV eradication is generation of latently infected cells, which may remain dormant for a long time and causes viral rebounds after treatment cessation. In order to understand the behavior of latently-infected cell population, we propose a mathematical model to illustrate the dynamics of virus-cell interaction. We parametrize our model using experimental data containing viral load, CD4 count and latently infected cells from the largest cohort of patients treated during acute HIV infection (HIV). Using our viral dynamics model we generate a large number of data sets to develop a machine learning framework which is subsequently used to predict frequency of latently infected cells in patients under treatment.

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187 9:00 am OO

Modeling the Coral Reef Microbiome and Black Band Disease

Maya Weissman, Cellular and Molecular Biology (U)

Coral reefs are some of the most diverse and valuable ecosystems on the planet, but an estimated twenty percent of the world’s coral reefs have been decimated due to stressors such as climate change, coral bleaching, and diseases. Pseudodiploria strigosa is a reef-building species abundant in the Caribbean that is currently being threatened by black band disease. P. strigosa, like all other coral colonies, functions as a holobiont where the coral animal relies on a symbiotic relationship with a complex microbiome. The composition and health of the microbiome is affected by high temperatures, eutrophication, and other stress conditions. In this poster, we present mathematical models, developed based on P. strigosa coral colonies data collected from Bermuda (Dinsdale Lab at SDSU), in order to investigate the relationship between the environmental conditions, the coral reef microbiome, and black band disease dynamics. In particular, we focus on evaluating the effects of temperature on the coral reef microbiome, which emulates the periodic changes in microbiome composition found in nature. The microbiome model is further extended to predict black band disease dynamics and identify the environmental threshold conditions that would cause the reef holobiont to shift from a healthy to a disease-associated microbial community. Our results show that temperature can have significant impact on the coral reef holobiont health, and can account for susceptibility to black band disease. Our models can be used to investigate potential strategies to protect reef ecosystems from black band disease and other stressors.

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188 9:00 am PP

Mathematical and computational models analyzing the effect of common toxins on embryonic development in the zebrafish model

Ashley Schwartz, Applied Mathematics (U)

The prevalence of increased levels of man-made chemicals including perfluorobutanesulfonic (PFBS) in our environment is a recent area of concern for its presence in water reserves. It is of particular interest to determine how these common water pollutants affect embryonic development and how

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exposure can lead to various developmental deformities. Dana rerio (zebrafish) is a vertebrate animal whose embryonic development closely mimics human development in many ways. In this study, we use mathematical models, computational models and image analysis to quantify and automate discovery of various abnormalities in zebrafish embryonic organs. The fluorescent microcopy images of zebra fish exposed to various degrees of PFBS is analyzed in MATLAB for deformities. Additionally, a differential equation model validated with a data fitting analysis is used to analyze abnormal zebrafish kidney excretion rates. The data analysis gives insight into the relations between chemical exposure and the onset of diabetes, kidney disease, and spontaneous abortion. This study shows that zebrafish exposed to PFBS causes deformities that contribute to disease formation. These results can be generalized to human embryonic development, allowing for a better understanding of PFBS and its effect on human embryos. Our findings highlight the implications of womb toxin exposure and its relation to the onset of disease later in life.

Session A-16

Poster Physical and Mathematical Sciences 3
Friday, March 1, 2019, 9:00 am
Location: Montezuma Hall

189 9:00 am QQ

California Condors' Exposure to Non-Halogenated Organic Contaminants at California Coast

Jade Johnson, Chemistry (U)

California condor populations were driven near extinction decades ago. Thanks to the success of captive breeding facilities, today, their population exceeds 400 individuals. Roughly half of the population has been reintroduced to the wild and now occupy coastal and inland habitats across the western United States and Baja California, Mexico. Nevertheless, the condors dwelling at coastal habitats are experiencing reproductive problems, namely, significant eggshell thinning. It is suspected this is due to dietary exposure to endocrine-disrupting chemicals, such as persistent organic pollutants (POPs), e.g. the notorious insecticide, DDT, and its related compounds. POPs are found at high levels in marine mammal carcasses, which serve as a food source for the coastal-dwelling condors. Most commonly, wildlife biomonitoring methods employ a targeted approach to quantify the body burden of known contaminants, predominantly halogenated organic compounds (HOCs). However, there are increasingly many unknown organic contaminants, which may be harmful and present but are unfound in a targeted analysis. A non-targeted analysis can identify new emerging contaminants of concern in complex environmental mixtures. This study uses a non-targeted approach to identify previously unmonitored non-HOCs that are more abundant in the blood of coastal, versus inland, condors. For analysis, condor blood samples are prepared following a protein precipitation protocol, a focused clean-up procedure, and lipid removal by gel permeation chromatography. Following sample preparation, the sample extracts were analyzed using a comprehensive two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (GCxGC/TOF-MS). To perform data analysis, an additional feature of the instrument software (ChromaTOF), "Statistical Compare", is used which enables comparison of large datasets of multiple groups of samples based on each peak's GC retention time and mass spectrum. Unique and more abundant compounds in the coastal population will be tentatively identified by comparing their spectra to similar mass spectra in the National Institute of Standards and Technology (NIST) electron impact (EI) library. Preliminary raw data has confirmed coastal populations have a significantly higher HOC load compared to inland populations, further data analysis is ongoing to compare the non-HOC profiles between inland and coastal condors.

190 9:00 am RR

Beluga and Pacific White Sided Dolphin Whole Blood and Filter Paper Analysis of PCB

Pamela Olguin, Chemistry (U)

Background:

Polychlorinated biphenyls (PCB) are a type of Persistent Organic Pollutant (POP). POPs have an anthropogenic origin that result from pest and disease control, crop production, and industry. These pollutants are lipophilic, persistent in nature, and can bioaccumulate. Whole blood and tissue samples are used to analyze the existence and concentrations of PCBs, but hopes are that a new method using cellulose filter papers will give similar results.

Methods:

Using both whole blood and correlating cellulose filter paper samples from marine mammals, a similar extraction method was completed and analyzed by gas chromatography-mass spectroscopy (GC-MS). Then, existing compounds in whole blood and filter paper samples were compared. Additionally, a lipid measurement was done for the whole blood samples.

Results:

The whole blood and cellulose filter paper samples were analyzed for: BDE 100, BDE 47, BDE 99, BDE 154, BDE 153, PCB 101, PCB 118, p,p-DDE, Nonachlor-trans, Nonachlor-cis, Chlordane-trans, Heptachlor epoxide, PCB 153, PCB 138, and PCB 180. From the GC-MS results similar compounds were detected in the whole blood and corresponding cellulose filter paper samples. However, the hepatachlor epoxide was not detected in either sample and chlordane-trans was only present in the whole blood samples. The concentration of POPs was greater in the whole blood samples when compared to that of the filter paper. Further statistical analysis will be conducted on the concentration of POPs.

Discussion:

The eight correlating whole blood and cellulose filter paper samples contained similar compounds that were detected from the GC-MS. The extraction method was shown to be

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efficient by the low detection of POPs in the blank samples. A greater concentration of POPs in the whole blood samples can be attributed to the greater quantity of whole blood sample compared to the cellulose filter paper samples. The analysis of all of the raw data obtained from this project has not been completed. However, current completed data indicates that cellulose filter paper may be a potential tool for persistent organic pollutant research.

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191 9:00 am SS

Evaluation of Alcohol Use Disorder in Mice Using Targeted Metabolomics

Elizabeth Costa, Chemistry with an emphasis in Biochemistry (U)

Introduction: Mass spectrometry (MS) is an analytical tool that is used for identification and quantification of molecules ranging from pure compounds to complex mixtures such as biological samples. The instrument works by ionizing chemical species by their mass to charge ratio. To obtain a higher degree of separation, MS is combined with liquid chromatography (LC) to efficiently separate complex mixtures. In the Forsberg lab, liquid chromatography coupled to high resolution mass spectrometry (LCMS) is used to perform metabolomics to decipher biological mechanisms of action between the gut and the brain. This current work highlights the connection between addictive behavior observed in alcohol use disorder and the gut microbiome.

Hypothesis: We have utilized LCMS and bioinformatics to identify metabolic pathways associated with central nervous system (CNS) signaling and regulation in alcohol addicted mice. Furthermore, targeted MS methods were optimized to validate the untargeted identification of metabolites.

Methods: Untargeted metabolomics was performed on metabolite extracts from the duodenum and jejunum of alcohol addicted mice that were treated with an antibiotic cocktail or water. LCMS chromatograms were analyzed using XCMS Online to identify dysregulated metabolites and their associated metabolic pathways. Targeted analysis was then performed on these metabolites to accurately quantify their changes in concentration. Precursor-fragment ion pairs for each analyte were optimized using analytical standards via direct infusion and comparison with the METLIN database. These ion transitions were tracked by LCMS on each of the mouse samples, then quantified using TASQ software.

Preliminary data: Metabolic pathway results yield sphingosine and sphingosine-1-phosphate (S1P) metabolism as well as eukaryotic ubiquinol-6 biosynthesis metabolism. Sphingolipids are widely known for their role as signaling molecules responsible for cellular communication, and S1P metabolism has been linked to gastrointestinal inflammatory diseases. Ubiquinol is the reduced form of CoQ10, which is an important antioxidant that has been shown to have beneficial effects on neurodegenerative diseases.

Conclusion: We developed a targeted metabolomics experimental procedure to quantify extracted metabolites from mouse colon samples. For future work we will analyze more tissues, such as the brain, to identify more communication pathways that may help us understand signaling between the gut and the brain.

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192 9:00 am TT

Using Untargeted Metabolomics to Understand the Gut-Brain Axis

Brijinder Soni, Chemistry (M)

Recently there has been a growing interest in linking perturbations in gut microbial activity to anxiety, depression and even neurological disorders. Our lab is probing this unexplored territory known as the gut-brain axis using metabolomics. Neuromodulatory metabolites including serotonin and dopamine are produced in large quantities from microbial sources. The Forsberg group uses a combination of MALDI-based Biotyping, high-resolution mass spectrometry (UHPLC-QTOF), and bioinformatics to gain biological insight into the complex interplay between commensal bacteria, the enteric nervous system, and the brain. Bacteroides fragilis and Lactobacillus rhamnosus are analyzed individually and co-cultured when exposed to various stressors, including stimulants (caffeine, N-acetyl-L-tyrosine, and theacrine). Bacterial species were grown anaerobically using BHI media until OD600 ~1.0 with and without stressors. Metabolism is quenched by flash freezing in liquid nitrogen. Metabolites are extracted with an organic solvent mixture and stored at -20ºC overnight to precipitate proteins. Global metabolomics is performed using RP and HILIC in both positive and negative mode on a Bruker Impact II QTOF. Data is processed using XCMS Online and Metaboscape. Metagenomic data integration is done using in-house designed software written in R and Python.

Bacterial species identifications have been confirmed using a Bruker MicroFlex MALDI and Biotyper database, a method which has shown greater accuracy than 16S rRNA sequencing. For co-cultures, this is particularly important to quantify the equilibrium proportions of bacteria species.

Cultures grown in the presence and absence of stressors have been prepared with optimized anaerobic conditions and timing for stressor addition by measuring growth curves at 600nm. Previously developed liquid chromatographic protocols have been used to gain broad coverage of metabolic features, including solvent gradients for both RP (Imtakt Scherzo Multi-Modal C18) and HILIC (Phenomenex Luna NH2). Gradients for preliminary data acquisition are much longer to achieve better resolution and greater metabolic coverage. High-resolution mass spectrometry data was acquired on a Bruker Impact II QTOF. Preliminary results showed the presence of several neural modulatory molecules including serotonin, tryptophan, glutamate, and dopamine.

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193 9:00 am UU

Synthesis of New HCV IRES Ligands

Anthony Simon, Chemistry Emphasis in Biochemistry (U)

Approximately 3.2 million people in the United States are currently living with hepatitis C virus (HCV). As a positive-sense RNA virus, HCV is prone to mutations, which makes it difficult to design drugs that can target either the viral proteins or the genome itself. It has been discovered that a small section of the 5' non-coding RNA, called the internal ribosome entry site (IRES) acts as a molecular switch. The IRES recruits human ribosomes to bind, which causes a conformational change in the IRES, and allows the ribosome to translate the RNA into viral proteins. Notably, this small section of RNA is highly conserved, as previously discovered by a study of over 1000 clinical strains of HCV that showed only two point mutations in the IRES. Due to this high degree of conservation, the IRES is a strong target for the design of a drug that mimics the natural ligand and forces the IRES into a conformation that will not recruit ribosomes, rendering the virus unable to reproduce.

It has been shown that precise shape complementarity based solely on hydrophobic interactions can significantly improve ligand binding even in hydrophilic target sites such as RNA. We have focused on synthesizing heterocyclic methylsulfoximine derivatives of the natural HCV IRES ligand that will take advantage of these space-filling interactions. The initial scaffold has been synthesized and tested on the RNA construct. The results are promising, so we are currently working on modifying the scaffold to be more like the native ligand to further improve binding to the IRES.

194 9:00 am VV

A Highly Stereoselective Synthesis of Lagunamide A: A Metabolite from the Lyngbya Majuscula Cyanobacterium Possessing Powerful Anti-Cancer Properties

Jared Stillman, Biology (U)

Background: Lagunamide A is a natural product originally isolated from Cyanobacteria with an exceptional biological activity showing great promise as a future therapeutic agent. Lagunamide A has many biological activities and exceptional IC50 values. High cytotoxicity is present against P388 murine leukemia cell lines (IC50 6.4-20.5 nano-M) and Ileocecal colon cancer (IC50 1.6 nM). This possible therapeutic has also impressive anti-malarial properties (IC50 0.19-0.91 micro-M). With such noteworthy activities, Lagunamide A shows great promise as a powerful therapeutic agent and brings the need for a shorter and higher yielding total synthesis of this macrocyclic depsipeptide, which would allow for easier biological studies. Current data shows the depsipeptide mode of action having an intrinsic apoptotic pathway by cleavage of capsase-9 which activates a series of cascades resulting in mitochondrial assisted apoptosis.

Results: We will present a novel stereocontrolled total synthesis of Lagunamide A. This encompasses a highly convergent asymmetric route that installs 5 of the 10 critical stereocenters. Four stereocenters are installed with high accuracy using two novel iterative Vinylogous Mukaiyama Aldol Reactions with high yields and excellent diastereomeric ratios. This is the highest yielding and shortest synthetic route for obtaining Lagunamide A. Although the VMAR methodology initially was a challenge for construction of the backbone, a systematic fundamental study was created and subsequently optimized, and these data for the synthesis of Lagunamaide will be presented. Along those lines, we will present a new optimized method for coupling unique N-methylated unnatural peptide fragments completed via solid phase synthesis, which is the most convenient route for creating the northern hemisphere of Lagunamide A. All data for each intermediates presented have been fully characterized via NMR spectroscopy, X-ray crystallography, FTIR, HPLC, and LCMS. This sets the stage for future work of Lagunamide A to be the syntheses of analogs for structure-activity relationship (SAR) studies which will be tested against various malarial and cancer cell lines.

Session A-17

Poster Education 2

Friday, March 1, 2019, 9:00 am

Location: Montezuma Hall

195 9:00 am WW

Examining the Association Between Feedback Specificity and Student Teacher Performance

Mae Tanmajo, Psychology (U)

Hypothesis: Is there an association between university-supervisor's feedback specificity and student-teacher performance?

Feedback is essential to promote learning, self-correction, and performance of teachers (Paulus, 1999; David et al., 2005). Various types of feedback, however, could provide alternative outcomes (Balcazar et al, 1985; Kluger & Denisi, 1996; Ilgen et al., 1979). Improved performance is best fostered through timely, specific feedback (Kreitner & Kinicki, 2001). Studies have reported that as specificity increases, feedback focuses more on relevant behaviors, providing information on self-correction and skill acquisition (Baron, 1988; Anderson, 1982).

The purpose of the present study is to examine effects of feedback specificity from university supervisors on student-teacher performance during a credential program. It is hypothesized that high feedback specificity is positively associated with higher student teacher performance.

Method

Participants

Two student-teacher candidates and their two university supervisors were selected based on their performance on a teaching performance assessment (edTPA), one high-performing and one low-performing.

Measures

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

Feedback. University Supervisor feedback was collected from Sibme, a virtual video-based coaching tool. Feedback specificity was measured by amount of tags, and detailed, corrected comments. Supervisors observed 5-7 videos per student and provided feedback about student-teachers' instruction.

edTPA. Student-teacher performance was measured by edTPA scores.

Analyses

Qualitative analyses were conducted by examining the feedback given by the university supervisors. Comments were coded as high specificity if the university supervisor responded with comments relative to behavior and correctional. Low feedback specificity was reported as comments irrelevant to the behavior in the moment and little to no correctional comment. The number of specific feedback comments and tags were tallied along with word counts (<20 words were coded as low-specificity and >30 words were coded as high-specificity).

Results

Feedback specificity is associated with student-teacher performance, such that higher specificity leads to higher student teacher performance.

Conclusion and Implications

Findings from this study can be used to enrich the knowledge of education professionals and attenuate unnecessary processes that may delay students' learning experiences in the classroom. More research is needed to understand the factors in feedback that affect student-teacher performance.

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196 9:00 am XX

Developing Language and Literacy Curriculum

Marina Sanchez, Child and Family Development (U)

Research implies that high quality preschool programs get children ready to learn and enter into school with the foundational skills needed for school achievement The purpose of this study is to examine language and literacy practices among preschool, transitional kindergarten, and kindergarten teachers by planning, questioning, and reflecting on current practices in order to cultivate a developmentally appropriate curriculum that engaged children and support their future success in school. Team meetings, consisting of Dr. Garrity, the school's principal, speech language pathologist, literacy resource teacher, pre-kindergarten teacher, transitional kindergarten teacher, and kindergarten teacher, took place over a two year period. These collaborative meetings were audio recorded to capture the thought process for developing reading curriculum that is both fun and developmentally appropriate for the children. The audio recordings were later transcribed for documentation and further analysis. Qualitative methods were used to analyze transcriptions from target team meetings using Dedoose to collect data and identify common themes, ideas, and concepts that were discussed. Initial results from the research study will presented at the student research symposium.

197 9:00 am YY

Supplemental Instruction (SI): The Relationship Between First Exam Date, SI Attendance, and Grades for Introductory Courses

Olivia Musil, Interdisciplinary Studies (U)

Supplemental Instruction (SI) is a program offered at San Diego State University that uses active learning strategies to advance student's understanding of high-risk courses. SI Sessions are facilitated by students that have demonstrated a deep understanding of the subject and occur twice a week for the entirety of the 15 week semester. SI was primarily offered in the Fall of 2015 for Dr. Laumakis' Psychology-101 course, yet expanded to include Chemistry 100 in the Fall of 2017. Both Chemistry 100 and Psychology 101 are introductory level courses completed overwhelmingly by first time-freshman students.

This study compares and contrasts the relationship between first exam date, SI attendance, and exam performance in Chemistry 100 and Psychology 101 for the Fall 2018 Semester. The courses are structured differently, Psychology 101's first exam is 15 days before Chemistry 100. The exam dates are September 20th and October 5th, respectively. Through preliminary research, results show students have higher test grades when they attend SI before and after the first exam. We hypothesize that SI is most effective for students who attend sessions early in the semester and frequent session attendance thereafter. Additionally, Supplemental Instruction will have higher attendance in classes with early first exam dates.

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198 9:00 am ZZ

Analysis of Supplemental Instruction Retention Rates Following Students from Introductory to General Chemistry

Ryan Colelli, Economics (U)

Supplemental Instruction (SI) targets high risk courses and attempts to reduce failure rates. The academic support groups are led by model students who were previously successful in the course. These study sessions utilizes peer-facilitated, active learning strategies to make difficult material easier to understand. Supplemental Instruction started at the University of Missouri-Kansas City in 1973 by Deanna Martin and was introduced at San Diego State University in 2015 in an Introduction to Psychology course. SI began in the Fall of 2016, for Chemistry 200, and in the Fall of 2017 for Chemistry 100. An initial examination of the Chemistry series showed a possible relationship between attending SI in Chemistry 100 and returning to SI for Chemistry 200.Our goal is to study retention rates and final grades of student who progress from Chemistry 100 to Chemistry 200.

To track retention rates, the number of students who attended SI in Chem 100 was compared to those who attended SI for Chem 200 the following semester. Students that were in Chem 100 in Fall of 2017 were grouped into SI and nonSI. To observe the retention rate, students that continued onto Chemistry 200

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in Spring 2018 were then subgrouped into either: SI for both courses, SI for Chem 100 only, SI for Chem 200 only, or no SI. An examination of the high school GPAs, SAT, and ACT scores of the students showed similar levels of readiness across all four groups. The preliminary analysis used to investigate a difference between the four subgroups was performed with Fisher's test using Monte Carlo simulations to generate an estimated p- value, to distinguish if there were a statistical difference amongst the distribution of grades between the groups. Since this test yielded an estimated p-value of 0.1019, we cannot determine that there is a statistically significant difference in grades between the four groups. The result contrasts previous in house research that demonstrates SI improves Chem 100 or Chem 200 grades when classes were analyzed individually, suggesting a possible Simpson's paradox.

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199 9:00 am AAA

Using a Self-Implemented Premack Principle Model to Increase On-Task Behavior in 9th Grade Males with Attention Deficits: A Single Case Design

Jennifer Dowlan, School Psychology (M)

The objective of this study is to use a self-implemented version of the Premack Principle model to increase on-task behavior. The participants were three high school males in ninth grade with attention deficits. The traditional Premack model requires two people: a student and an interventionist to provide prompting and reinforcement delivery. Adding the self-implemented component will teach the students to set their own achievable goals and regulate their own behavior until the task is complete. Results found a positive increase in on-task behavior for these students. Each student began with a stable baseline of zero minutes on-task to an upward increase in productivity. More research could explore methods to generalize and maintain the self-regulation skills for students to use in other classrooms, other grade levels, and in their future adult life.

Overall, results showed a positive impact across the three participants. There is a large effect size for the current study (d-index = 1.20). Student C did report a lower effect size in the questionable range (d-index= .68), but the small effect size could be a result from the minimal exposure of the intervention. The PAND score for all three students was 100%. This means there were no overlapping data between any of the students' baselines and intervention phases. Each student exhibited a stable trend of zero minutes of productive behavior, and an immediacy of effect when the intervention began. This means that the self-implemented Premack Principle model improved these students' on-task behavior. These students may have attention deficits for the rest of their lives; they need to learn how to regulate their own behavior to obtain success in their future.

200 9:00 am BBB

Is there a relationship between preschool attendance and enrollment in advanced placement classes?

Ella Holton-McCoy, Liberal Studies (U)

Early childhood education is an integral part of the learning path for students, yet many students are not provided with the opportunities to attend high-quality early childhood programs. As students progress through their education, they are often presented with the option to take advanced placement courses in high school. Voluntarily choosing to take honors classes shows rigor and drive which may or may not persist into higher education. This study will investigate the potential relationship between early childhood education attendance and whether or not students take an advanced placement exam.

Consideration will be given to the barriers and gap in information often facing racially diverse and socioeconomically disadvantaged students' College Board publishes statistics about students in the graduating class and students passing scores on AP exams. According to College Board, of the 23,281 African American students in California enrolled in high school, only 5,715 students attempted an AP exam. In contrast, White students made up 121,735 of high school graduates in California and 43,392 students attempted an AP exam (College Board, 2013). Research reveals that 84% of African Americans enrolled in a preschool program at the age of 4 while 82% of White students. While both races have high rates of preschool attendance their AP representation is not comparable (Barnett & Johns, 2013). This research will begin to develop a theory about the intersection of attending preschool, race, family background and a students' choice to take an advanced placement exam. A brief version of the survey was piloted and preliminary results indicated students who enrolled in AP courses in high school had attended preschool as young children. Additional data will be collected through an online survey focusing on college students experiences in early childhood. Data will be analyzed using Analysis of Variance and Analysis of Covariance in order to determine if there are differences in enrollment in Advanced courses and subsequently college. The implications of the conclusions from this study will potentially provide preliminary evidence that attending a certain type of preschool can potentially correlate with a child's pursuit of more rigorous classes in high school and the racial factors that are also associated with AP participation and preschool.

SRS

Abstracts of Presentations

Session B

SAN DIEGO STATE UNIVERSITY

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Session B-1

Oral Biological and Agricultural 1
Friday, March 1, 2019, 11:00 am
Location: Pride Suite

201 11:00 am

Generation and Characterization of Isogenic iPSC Models with Copy Number Variations Linked to Autism Spectrum Disorder

Josephine Chu, Biology emphasis in Cell and Molecular Biology (U)

Autism spectrum disorder (ASD) is a severely debilitating neurodevelopmental disorder that afflicts 1 in 69 children and is characterized by impairments in social communication and restricted or repetitive interests or behaviors. While attempts have been made to study the mechanisms of this disease, current treatments remain unavailable due to limited knowledge of ASD's cellular pathology. This highlights the need to understand the underlying cellular and molecular basis of aberrant brain development in ASD. Previous investigations into the cellular and molecular basis of ASD have relied upon comparisons of patient cells to neurotypical control cells, but given the differences in genetic backgrounds, interpretations of phenotypic differences have been complicated and often require many control cell lines. To overcome the challenges introduced by genetic variability, we focused our efforts on generating and characterizing ASD brain development in a well-characterized induced pluripotent stem cell (iPSC) line, CV-B. The CV-B line serves as our wild-type parental control, into which we will individually introduce copy number variation (CNV) of high prioritized ASD-linked loci (7q11.23, 16p11.2, and 17p11.2) by targeting a Single guide CRISPR/Cas Of Repetitive Elements (SCORE), a method shown to introduce deletions or duplications into targeted loci. Since our targeted CNV loci contain genes that regulate neuronal differentiation, signaling pathways, and gene expression, we hypothesize that compared to a wild-type parental cell line, the ASD models will display differences in neuronal development, consistent with previously characterized differences between patients and neurotypical controls. We predict that generation and characterization of an isogenic series of iPSC lines harboring ASD-linked mutations will be a useful resource for the autism research community and help to enable discovery of potential drug targets, affected cell types, and diagnostic methods for patients of this increasingly common disease.

202 11:15 am

The effect of oxidation and post translational modification on isocitrate dehydrogenase 1 (IDH1) activity

Viraj Upadhye, Biology (U)

Isocitrate dehydrogenase 1 (IDH1) is an enzyme found in many forms of life that catalyzes the reversible oxidation of isocitrate to α-ketoglutarate (αKG). Since increased transcription of IDH1 has been observed in lung, brain, urothelial and prostate cancers, exploring the activity and regulator of IDH1 could lead to a better understanding of these cancers. A key function of IDH1 is its production of NADPH which is critical for the biosynthesis of lipids and the mitigation of reactive oxygen species (ROS) that occur during cellular respiration. Increased levels of ROS can damage proteins and DNA, disrupt cell signaling and ultimately, cause cell death. We hypothesize that tumor cells rely on upregulation of IDH1 to increase NADPH to protect tumor cells from the increase of ROS. Cells generate ROS as a byproduct of metabolism and have evolved various pathways to prevent this damage, one such pathway is through post-translational modifications (PTM) on cysteine residues in the form of glutathionylation. Post-translational glutathionylation is a reversible process and shields the protein from irreversible damage caused by ROS but little is known how this PTM effects the kinetic activity of IDH1. My experiments have shown a loss in activity in IDH1 in the presence of simulated ROS at non-denaturing concentrations (5mM H_2O_2), suggesting that there may be modifications being made to the enzyme that require affect activity. To further test this hypothesis, I mutated two cysteine residues to serine in IDH1 to determine if cysteine glutathionylation is a mechanism of protein inhibition. Preliminary experiments show that the mutation does not cause a significant change in the kinetic activity under normal and oxidizing conditions, but further testing is needed. Understanding the regulation mechanism of IDH1 could explain the resilience of cancer cells and their ability to survive conditions that normal cells find unbearable. By establishing the role of oxidative stress on IDH1 catalysis, we can illuminate mechanisms of tumorigenesis and identify new pathways to therapeutically target.

203 11:30 am

Examining the proliferative potential of the atrial cardiomyocyte

Jeffrey Jones, Biology (U)

Rationale: Cardiac development is characterized during the embryonic and neonatal stages by hyperplastic or proliferative growth of both atrial (ACMs) and ventricular cardiomyocytes (VCMs). While VCMs comprise the overwhelming majority of the cardiac mass in the adult heart and provide the contractile force for pulmonary and systemic circulation, they are uniquely unfit for such a crucial role due to their limited regenerative capacity in adulthood. Instead, VCMs respond to pathological insults such as a myocardial infarction, by cellular hypertrophy or growing in size. Coordinately, VCMs exhibit a genetic reprogramming event in adulthood, namely by downregulating the expression of High Mobility Group Box protein (Hmgb1). However, while it is known that many of the same genes that are downregulated in the adult VCMs remain expressed in the adult ACMs, neither the proliferative capacity of, nor the expression levels of HMGB1 in adult ACMs are known.

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

Objective / Methods: We postulate that ACMs have a greater proliferative capacity than VCMs, and that proliferation is coordinate with Hmgb1 expression. ACMs and VCMs will be isolated and cultured from neonatal and adult mice. Subsequently, hyperplastic growth will be monitored over a period of time via cell counting and cell cycling markers will be imaged via confocal immunocytofluorescence. Hmgb1 expression will be quantified via both quantitative real-time PCR and immunoblotting from both isolated cells and atrial and ventricular tissue extract across various time points throughout cardiac development.

Results: VCMs were cultured and displayed minimal hyperplastic growth with a doubling rate of 4-days. Hmgb1 transcript levels were maintained at high levels in ACMs from tissue extracts across development (murine ages postnatal days 1, 7, 14, 21, 10-weeks, and 52-weeks), while expression was lost in VCMs by 10-weeks of age.

Conclusions / Future Direction: Our results demonstrate a direct correlation between Hmgb1 expression and VCM proliferation. Future experiments involve the culture of ACMs in order to measure rate of proliferation, as well as knocking down Hmgb1 using siRNA in order to measure rates of proliferation in ACMs and VCMs.

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204 11:45 am

A novel immunotherapy, VAX014, mediates tumor regression and immune cell infiltration in a mouse model of melanoma

Katherine Reil, Cell and Molecular Biology (M)

Melanoma is an aggressive cancer that is responsive to immunotherapy but frequently metastasizes if not locally contained by surgery or therapeutic intervention. Consequently, new localized immunotherapeutic treatments are desperately needed. We have developed an E. coli derivative called recombinant bacterial minicells (rBMCs) that target and deliver therapeutic molecules directly to cancer cells. VAX014 rBMCs have been engineered to incorporate invasin, a rBMC surface-localized protein specific for $\alpha 3\beta 1$ and $\alpha 5\beta 1$ integrins expressed on tumor cells, and perfringolysin O (PFO), a bacterial toxin that facilitates membrane permeabilization and oncolysis.

We used the B16F10 mouse model to test the hypothesis that VAX014 can serve as a locally administered intralesional oncolytic immunotherapy for melanoma. In vitro experiments confirmed B16F10 expression of cell surface $\alpha 5$ and $\beta 1$ integrins, established potency of VAX014, and demonstrated an oncolytic mechanism of action. These data support that B16F10 is sensitive to VAX014 and undergoes rapid oncolysis upon VAX014 exposure.

To examine the therapeutic value of VAX014 following intralesional administration in vivo, a series of anti-tumor efficacy experiments were initiated on intradermal B16F10 lesions in immune competent mice. Dose-range finding studies were conducted to identify the most effective treatment regimen of 1x/week at a concentration of 1.5x108 VAX014/dose. Using this dosing schedule, we have observed two different categories of response in mice, categorized as: partial ($n=7$; $p<0.0001$) or complete ($n=8$; $p<0.0001$) responders to VAX014 treatment. All VAX014 treated animals ($n=15$) experienced enhanced survival ($p<0.0001$) compared to saline controls.

To examine if effector immune cells are required for VAX014 efficacy in vivo, a preliminary immune-cell depletion experiment was conducted. Antibodies against CD8+ CD4+, and NK cells were administered prior to and during VAX014 treatment to deplete these immune cell subsets. From this study, CD8+ T-cell depleted mice demonstrated a significant reduction in survival ($p<0.001$) signifying an imperative role of CD8+ T-cells in VAX014-mediated tumor regression. Because CD8+ effector T-cells are required for VAX014 treatment, additional studies evaluating VAX014 synergy with immune checkpoint inhibitors are being conducted. In summary, B16F10 is responsive to VAX014 intralesional treatment and these studies support the rationale for clinical investigation of VAX014 in melanoma patients.

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205 12:00 pm

Modifying the Gal-4 Assay to Test for Host Substrates Cleaved by Dengue and Zika Protease

Nina Barr, Cellular and Molecular Biology Masters Program (M)

Arboviruses infections have become true epidemics within the recent decades. These viruses transmitted by mosquitos have seen a vast increase due to globalization, urbanization and climate change. Among these viruses the most notorious are Dengue virus (DenV) and Zika virus (ZIKV). DenV transmission leads to dengue fever and dengue shock syndrome. ZIKV has become more impactful within the last decade as it leads to deleterious neurological development in the fetuses of infected pregnant women. Currently, there are no preventative treatments. As part of their life cycles, these viruses partly rely on the processing of their polyprotein for replication. Proteolytic cleavage by the viral proteases is necessary to create the viruses final and functional proteins. As obligatory parasites, all viruses share a complex and dynamic relationship with their host. Viruses within the Flaviviridae family, including DenV and ZIKV, thus rely not only on their own encoded protease but also on the host proteases. Importantly, the viral protease cleaveshost proteins that may cause symptoms associated with viral infections. Through a bioinformatics approach we are searching for novel proteins within the human proteome cleaved by the DenV and ZIKV proteases. Here we aim at confirming the in silico findings by modifying the Gal-4 assay developed in the laboratory. In order to monitor cleavage of putative cleavage sites we are introducing their sequences within the Gal4 domains. The viral protease will then be supplied in trans. In the event of cleavage the cells will be non-fluorescent. Otherwise they will fluoresce by expressing the green fluorescent protein. Analysis is performed by fluorescence microscopy and flow cytometry. Hits found in silico and confirmed through our biological assay in mammalian cells will be further investigated. We hope to further our understanding of the biological significance of

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cleavage of host proteins by the viral protease, in an attempt to gain additional tools to fight viral infection.

206 12:15 pm

Linking Multi-Omics and Ultrastructure to Function in Methylotuvimicrobium

David Collins, Cell and Molecular Biology (D)

Background: Methanotrophs are microbes that utilize methane as a sole energy and carbon source and are a genetically engineerable, making them an ideal platform for sustainable biotechnologies. Several features of cell biology unify the bacterial methanotrophs such as efficient metabolic networks, dynamically structured intracytoplasmic membranes (ICM) as well as surface layer proteins (SLP). Few studies link data gathered from 'multi-omics' to cellular function in methanotrophs and as large data sets become increasingly common this will be crucial to a systems level understanding in 21st century model organisms.

Methods: To dissect the global changes in biology induced by substrate and mineral availability cultures of the model aerobic methanotroph Methylotuvimicrobium alcaliphilum 20ZR were grown in bioreactor units while changing media composition. Samples were then subjected to total protein mass spectrometry with our collaborators at Pacific Northwest National Labs, RNA profiling with transcriptomics and microscopy at the SDSU Electron Microscopy facility.

Results: The presence of copper induces major shifts in the proteome as well as ICM development in M. alcaliphilum regardless of trace minerals such as Calcium and Lanthanum, reinforcing the established copper switch in methanotrophs. Proteins of unknown function such as MalcV4_0971 and MalcV4_0972 are particularly abundant in all growth conditions as well as effectors responsible for chemotaxis chemical sensing. The function of these proteins was investigated through mutagenesis and by translational fusion to green fluorescent protein. We demonstrate that MalcV4_0971 and MalcV4_0972 proteins are surface layer proteins in Methylotuvimicrobium.

Conclusions: Based on localization of GFP fusions, transport of SLP is dependent on a Type I secretion system, which recognizes the C-terminus of the protein. Applications of fundamental aspects of cell biology in methanotrophs have the potential as C1 biocatalysis platforms by harnessing their secretion systems for efficient protein production and deciphering the biology of substrate sensing to detect methane in the atmosphere.

207 12:30 pm

A role for bacteria in the development of the marine tubeworm hydroides elegans via regulation of the Protein Kinase C pathaway

Kyle Malter, Cell and Molecular Biology (D)

Bacteria-animal interactions play a widespread role in stimulating the developmental transitions of marine invertebrates. While these interactions are critical for processes such as coral reef formation, life history transitions, and biofouling. we know little about the mechanisms mediating these beneficial bacteria-animal interactions. In many marine invertebrates, Protein Kinase C (PKC) signaling has been implicated in mediating bacteria sensing and response, which canonically signals via lipid second messengers to directly induce a targeted signal transduction cascade in eukaryotes. To this end, we have shown via a pharmacological and knockdown approach, that the PKC pathway is both necessary and sufficient to induce metamorphosis in a model tubeworm, Hydroides elegans. This evidence demonstrates that bacteria stimulation occurs via the PKC signal transduction pathway. We further determined that the bacterium, Pseudoalteromonas luteoviolacea (P. luteo), injects a protein effector we call MetE, for Metamorphosis Inducing Effector, that induces tubeworm metamorphosis through the cellular PCK response. The effector protein shares no homology to any known proteins, however, via biochemical analysis, we have shown this protein exhibits lipase activity and binds Phosphatidlyinositol-(3)-P and cleaves this substrate via Phospholipase D activity. Establishing RNAi assays and collaborating this data with known pharmacological data we can reliably show specificity for the PKC pathway and yields insight into bacteria-sensing systems animals use to mediate developmental timing and response.

Session B-2

Oral Interdisciplinary 3

Friday, March 1, 2019, 11:00 am

Location: Park Boulevard

208 11:00 am

Isolation versus Companionship in Other and Outsiders

Brooke Ochoa, Television, Film, and New Media (U)

Within society marginalized groups face a paradox of hypervisibility and invisibility in the eyes of those who are deemed as "normal". Outsiders are scrutinized with the keen eye of society seemingly eager to pounce at the slightest hint of their perceived transgression. Despite this, the hardships that others often suffer through fall prey to the blind eye of those in power. This paper investigates how marginalized groups of others and outsiders are affected by society through the examination of their portrayal within literature and film. It delves into the relationship between isolation and ostracization from society, as well as how companionship between outsiders may be the solution to the inherent resentment that comes with the act of "othering". The four works within which these relationships were examined include; Mary Shelley's Frankenstein, Nathaniel Hawthorne's The Scarlet Letter, Guillermo del Toro's The Shape of Water, and John Steinbeck's The Grapes of Wrath. Frankenstein and The Scarlet Letter both offer cautionary tales of how isolation can be detrimental to outsiders from society, while The Shape of Water and The Grapes of Wrath offer the solution of unity to the pain that comes with being an "other". The various literary

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and screenwriting techniques used within the works further illustrate the pain found within those who are "othered" and highlights the triumphs when these outsiders join together. All of these works point to the ultimate solution to being outcast from society, that being that marginalized groups should find solace in their similarities rather than draw lines due to their differences. This is the only way to combat the suffering that is inherent to the life of an other and an outsider.

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209 11:15 am

Picking Your Poisons: Determining Veneno-magical Characteristics through the Greek Magical Papyri in Translation

Johnny Larson, History (M)

A prescription for “evil sleep”: gall of horned viper, seeds of western apples, poisonous herb; pound them together; make into a ball and put [it] into the food! (PDM xiv 737-38)

Modern conceptualizations of poisons are relatively clear-cut. Our society tends to agree when an incident—whether a politician mailed an ambiguous white powder or a Russian spy poisoned with radioactive materials—involves the use of poisonous materials that aim to harm an individual. Such a clear-cut recognition was not the case when it came to delineating poisonous materials and their desired effect in the ancient world. The spell quoted above, for instance, employs poisonous herbs and organs of venomous animals to produce an “evil sleep.” Investigating why poisonous materials are represented in a magical spell like this one, and many others like it, elucidates the way that poisons were conceptualized in the Roman Empire. This study employs a close textual analysis of spells in grimoires to explore how venena, the Latin term for both poison and magic, is categorized in third- and fourth-century CE spell collections like PGM IV, PGM VII, and PDM xiv. While my invocation of the concept of a veneno-magical divide is a novel one, this study fits into the broader efforts of scholars like Hans Dieter Betz and Christopher Faraone to amend current definitions of ancient magic. Concurrently, this argument will be contextualized among the rich cultural backdrop of poisons as they were perceived in the tracts of natural historians and biographers.

In looking at the mediums in which magic and poisons were grouped, this study demonstrates the need to better define ancient magical practice within its respective milieu. Subsequently, better understanding ancient magical practice with respect to venena highlights the anxieties that existed surrounding both foci in the social consciousness of the Roman Empire.

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210 11:30 am

Plagues, Nazi Germany, and Vampires: An Alternative Insight Into the Rat Imagery in F.W. Murnau’s Nosferatu

William Lambert, Creative Writing (M)

Plagues, Nazi Germany, and Vampires: An Alternative Insight Into the Rat Imagery in F.W. Murnau’s Nosferatu

F.W. Murnau’s Nosferatu remains one of the most influential horror films of all time. While Orlok is a pop culture icon, his rat like design stirs controversy among scholars linking it to Jewish stereotypes; however, if one were to view Nosferatu with different lens, it can be argued that the rat imagery plays into the film’s thematic elements by making subtle references to the Black Death, 1920s Germany, and most importantly the horrors of scapegoating. By analyzing the thematic possibilities, the movie’s portrayal of nationalism becomes more ambiguous; potentially offering a more complex insight that relates to societal issues such as persecution, bigotry, and nationalism. Before analyzing the film it is necessary to discuss theorist Robert Miles’s “Abjection, Nationalism, and the Gothic,” who argues that the Gothic is more concerned with dramatizing a nation’s history than choosing a stance on nationalism. Miles uses his interpretation of abjection which demonstrates that the stances of abjection and nationalism are ambiguous in the Gothic. This concept of abjection and nationalism can be applied to Nosferatu by examining Orlok’s rat image and its thematic effects. The film’s title “Nosferatu” means plague carrier, and rats are known for spreading diseases. Nosferatu incorporates the plague to explore the marginalization that comes out of it, which is shown through the character Knock. Knock’s persecution reflects 1920s Germany and possibly Murnau’s own fear of getting persecuted under German law. As a closeted gay man, Murnau felt like an outsider, which is reflected in some of his films. While Knock’s wicked behavior makes it difficult to see a criticism towards nationalism, some of Murnau’s later films are clearer on their stance against nationalism by siding with the abject figure. Despite its flaws, Nosferatu, like other Gothic stories is ambiguous in its message, but that ambiguity allows multiple readings. There is a possibility that Murnau used the rat imagery to explore the horrors of scapegoating, which still occur. Since people live in a world full of persecution and hate, the movie’s reflection of Germany’s nationalism continues to stay relevant, making the film accessible enough for modern audiences.

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211 11:45 am

Simone de Beauvoir and Third Cinema: A Feminist Dialogue

Andrea Alvarado, History (M)

This research seeks to discuss Simone de Beauvoir’s political ethics regarding the Algerian War and her feminist theory of “the other” in relation to films of Third Cinema, a movement that challenged capitalist Hollywood productions, criticized the “First World’s” imposition of media on the “Third World,” and focused on subjects typically written out of, or exoticized in Western film. I utilize post-colonial film theory, post-structuralism, and feminist theory in the analysis of films and novels. The ideology of Third Cinema and Beauvoir’s philosophy deserve a comparative study because of their characterization of “the other,” critique of media dissemination, and the shared belief that there cannot be a single overarching idea of feminism. Through the exploration of identity reclamation and individual responsibility, a dialogue may be created between Western white feminism and Third Cinema feminism.

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In 1969, Fernando Solanas and Octavio Getino published Toward a Third Cinema, a manifesto that called upon directors in the so-called "Third World" to reject the Hollywood capitalist film model and reclaim their national identity. The Argentine directors drew heavily from Marxism, advocating for a revolution against bourgeoise cinema embodied in Hollywood, and the ideology spread to Asia and Africa, continuing into the 1990's. While at first a male-dominated genre, feminist film makers gained prominence and produced films that explored gender and sexuality in relation to post-colonialism.

Feminist filmmakers of Third Cinema asserted that Western feminism cannot adequately address the conditions of inequality of women in the non-Western world. Likewise, Beauvoir connects her theory of "othering," seen in The Second Sex, to political, colonial and economic oppression, not just gender. Her involvement in FLN member Djamila Boupacha's trial as well as her novel, Les Belle Images, evidence her complex relationship to the war abroad; as a French citizen she felt responsible for the suffering caused by the Algerian War. Both Beauvoir's writings and the films of Third Cinema prompt viewers to consider culpability through inaction, the systemic inaccessibility of art produced by the non-Western world, and that some aspects of feminism may still be rooted in patriarchal, colonialist ideology.

212 12:00 pm

Fictionalism and Creatures of Fiction

Michael Lin, Philosophy (M)

This work looks at typical Meinongian views and anti-Meinongian views regarding non-existent objects, and more specifically, fictional characters. The Meinongian view argues for a special type of being which fictional characters have, while typical anti-Meinongians denies that fictional characters can exist whatsoever. Peter van Inwagen, an atypical anti-Meinongian, raised the point that fictional characters do have a special type of being, of which he names creatures of fiction. Although this theory allows for some talks of fictional characters instead of none at all (if we assume they do exist), we are still tied by anti-Meinongian complications.

Hence, this work applies fictionalism to the being of fictional characters in order to expand on van Inwagen's theory. Broadly defined, fictionalism as a metaphysical theory that denies the existence of any abstract objects or concepts unless they are in a set context. This meshes well with fictional characters, as believing in fictional characters existing, regardless of types of being, requires contexts. Specifying contexts and the audience buy-in is central to this fictionalist view, and it creates an intuitive explanation about the being of fictional characters while still explainable in metaphysics. Specific examples are pulled from tabletop role-playing games such as Dungeons and Dragons, where audience buy-in to a specific context and suspension of disbelief allow for meaningful conversations regarding creatures and characters that do not exist in reality.

Works consulted includes "Belief About Nothing in Particular" by Fredrick Kroon, "Creatures of Fiction" by Peter van Inwagen, and "Metaphor and Prop Oriented Make-Belief" by Kendall Walton.

Session B-3

Oral Interdisciplinary 4

Friday, March 1, 2019, 11:00 am

Location: Tehuanco

213 11:00 am

Fatigue Performance of a Nanocrystalline Structure

Ken Ramirez, Mechanical Engineering (U)

The summer research project that I have participated in 2018 summer was about proving Professor Wenwu Xu's hypothesis on nanocrystalline grain boundaries possibly being able to disperse forces applied on a material ultimately leading to a fatigue free material. This hypothesis leads to a new type of bimodal microstructure of materials that has never been reported before. Metals with such kind of bimodal microstructure possess significantly increased fatigue performances as compared with their conventional microcrystalline counterparts. In specific, in this new bimodal microstructure, each micrometer-sized grain is separated by a network of ultrafine nanocrystalline structure.

Thus, my summer project was to collect data on a model made up of pure aluminum and apply an oscillating of tension and compression through computer simulation. The model created was a scrutinized representation of the border between a nanocrystalline boundary layer and a grain, each being a cube and then stacked to create the bimodel microstructure. Two types of variations were modeled, a set with various numbers of grains and another with various heights for the nanocrystalline grain boundary.

From the results obtained from the research, we observed two trends of the material dispersing force. The first trend was the more grains present in the grain boundary dispersed the force applied more effectively. The second trend was as the height of the grain boundary increased it was able to nearly eliminate all fatigue introduced.

From this research, Professor Xu's hypothesis has been proven that nanocrystalline grain boundaries are capable of reducing fatigue from being introduced into a material. Some of the preliminary results have been published in a peer-reviewed journal Computational Materials Sciences, in which I am the 2nd author. Currently, I am performing comprehensive data analysis, which may lead to another paper in this year. Also, the next step of the research would be to use a material that is widely used in the real world of mechanical engineering, such as aluminum-magnesium alloy, and observe its effectiveness to be determined if it is worthy to conduct a large scale simulation on it.

214 11:30 am

Zinc-Intercalated 1T-MoS2 on Si Nanowires for Photoelectrochemical Hydrogen Generation

Sabrina Younan, Chemistry (M)

Hydrogen, a sustainable clean energy carrier, has been

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regarded as one of the most promising alternatives to unsustainable carbon-based fuels. Photoelectrochemical (PEC) water splitting, an attractive approach to the production of hydrogen, requires high-performing, stable, low-cost electrocatalysts to promote the hydrogen evolution reaction. Combining electrolysis of water with artificial photosynthesis is a promising opportunity to produce hydrogen with a system that derives energy from sunlight. However, technical challenges remain for the development of highly efficient electrocatalysts and the fine interface between electrocatalysts and photoelectrodes. Herein, we report the performance of zinc intercalated 1T-MoS2 nanosheets drop-casted onto silicon nanowires. Surface modification of planar silicon into silicon nanowires maximizes the device's incident photon-to-current efficiency, allowing a significant increase in solar to hydrogen conversion efficiency. HER activity of Zn-doped 1T-MoS2 on silicon nanowires produce a 0.30 mV vs RHE onset overpotential with the ability to achieve ~ 37 mA cm-2 current density. Platinum-coated silicon nanowires produce a 0.35 mV vs RHE onset overpotential and achieve ~ 43 mA cm-2 current density. This research opens new opportunities for the future commercialization of PEC devices employing the electrocatalysts and semiconductors discussed herein.

215 11:45 am

Integration and Testing of Concentrated Full Spectrum Optimized Hybrid CPV/T System

Naman Gupta, Mechanical Engineering (M)

Full spectrum optimized transmissive solar cells have multiple p-n junctions made from different semiconductor materials. Each material's p-n junction produces electric current in response to a different wavelength of light, which means the cell allows absorbtance of a broader range of wavelengths and improves the cell's conversion efficiency. Light(infrared) transmitted through the cells is then received by a thermal receiver/heat exchanger to heat the water/oil inside a serpentine patterned channel with dimples to decrease the pressure drop and increase heat exchange rate. The photovoltaic PV module designed at Tulane University, a partner on our project, has a 7 X 7 square array of full-spectrum optimized transmissive PV cells made by SPECTROLAB and thermal receiver designed and fabricated by USD.

In this thesis, a high Flux solar simulator (HFSS) using single 15kWe xenon short-arc lamp with a truncated ellipsoidal reflector was optically characterized at San Diego State University. This facility makes it possible to form a uniform high radiation flux density distribution over a spatially adjustable platform moving in and out of focus reaching stagnant temperatures, allowing analysis of prototypes under concentrated solar energy conditions.

A novel, diffusely transmitting target method was developed to make flux density distribution maps with help of image processing in MATLAB for simulator and on-sun (parabolic dish) testing. Results from Lambertian target and diffusely transmitting target have been compared.

The goal of the current project has been to assemble and initially test the designed Concentrated Photovoltaic/thermal system under high fluxes, results up-to 200 suns concentration have been presented. Temperature profiles and electrical output are used to measure the efficiency of the CPV and Thermal Receiver.

A tank-in-tank design, thermal energy storage system, insulated by vacuum and copper shields carrying 10Ltr. of solar salt at 560°C has been tested for 6 hours round trip efficiency.

216 12:00 pm

Nondestructive Evaluation of Mechanical Behavior in Polymers using Terahertz Time-Domain Spectroscopy

Nha Uyen Huynh, Mechanical Engineering (D)

Terahertz waves have recently been gaining attention for imaging and characterization of different material systems with an intermittent focus on polymers. Thus far, a keen effort has been directed in measuring the intermolecular vibrational modes during the polymerization process, the indices of refraction, transmission, and absorption, as well as some physical properties. However, the investigation of the properties while the material is being mechanically loaded has not been yet reported. Since most polymers are transparent to terahertz waves, it provides the ability to couple a loading and characterization setup at the same time to uncover the in-situ dynamic behavior of polymers as a function of the loading mode (e.g., tensile or shear), amplitude, and strain rate. Due to unavailability of experimental mechanics setups capable of dynamically loading the materials while simultaneously characterizing the molecular conformational changes in the polymer structure, where a gap in the understanding of the primary impact mitigation mechanisms persists; hence hindering the optimization of the effectiveness of polymer-based materials. The goal of the proposed project is to gain a fundamental insight into the mechanics of polymers during different loading scenario. With such deeper mechanics insights, new material or material systems can spring into innovating monolithic or multi-layers advanced polymer composites.

217 12:15 pm

Triple dipping: magnetic, capacitance, and acoustic wireless energy transfer through strain-mediated composite multiferroics

Scott Newacheck, Mechanical Engineering (D)

Although wireless energy transfer has been around for over 120 years, industry has been rapidly developing more applications employing the technology in the past decade due to the increase complexity of electromechanical systems with higher power requirements. Many mediums of wireless energy transfer have been exhaustively investigated such as acoustic, capacitance, and inductance because each have key advantages making them uniquely desirable depending on the application benefiting from it. However, wireless energy transfer based on these technologies are limited to the macroscale due to significant losses at the micro and nano-scales.

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Alternatively, composite material systems with strain-mediated magnetoelectric coupling are exploited providing a paradigm for nanoscale miniaturization. A subclass of magnetoelectric composite multiferroics can bi-directionally couple AC electric fields with AC magnetic fields using mechanical strain as a mediator. Serendipitously, AC electric fields, AC magnetic fields, and vibrations are the mediums used in capacitance-, induction-, and acoustic-based wireless energy transfer, respectively. Consequently, strain-mediated composite multiferroics are exceptionally positioned to transform all these modes of wireless energy transfer. This paper analytically and experimentally reports the ability of composite multiferroic hollow cylinders to wirelessly transfer energy to-and-fro laminated multiferroic plates using AC magnetic flux as an energy carrier. In all, the composite cylinders in conjunction with laminated plates are successfully demonstrated as a novel technology of bi-directional magnetoelectric-based wireless energy transfer.

218 12:30 pm

Effect of Creep Loading on the Performance of E-Glass/Vinyl-ester Laminated Composites

Geovana C. V. Pessoa, Mechanical Engineering (D)

The wide implementation of fiber reinforced polymer (FRPs) matrix composite materials in the construction industry requires a performance metric accounting for the creep behavior of polymers in response to long-term static and dynamic loadings. The objective of this research is to uncover the effect of constant loading on the flexural mechanical properties of E-glass/Vinyl-ester composite material. Two sets of samples were extracted from a prefabricated composite panel. One set of samples were tested quasi-statically to establish a benchmark of the properties. Another set of samples were subjected to constant loads for up to 48 hours, while recording the creep strain. Regardless of the testing methods, failure was determined to be strain-driven based on an experimentally determined critical strain value. Mechanical properties were found to be insensitive to the strain rate with the low rate regime, while being mildly sensitive to creep loading. Samples that survived the creep testing were subsequently tested quasi-statically, where the flexural stress-strain behavior and the associated mechanical properties showed dependence on the previous creep loading. Results show that the sample without creep loading failed on average once its strain reached a level of ~1.08%, however, the samples that experienced creep load failed once the composite reach an average strain on ~ 1.14%. Finally, the creep response was fitted into Baily-Norton power law, which allowed forecasting the creep life based on a strain failure criterion. A life prediction of more than 50 years was considered infinite life based on expectancy of civil infrastructure to last in deployment. The tested panels exhibited infinite life under loading scenarios commensurate with field loading. Our results can be used as a guideline for the design of composite-based construction structures under constant loads for a long duration as well as ambient operating and environmental conditions.

Session B-4

Oral Physical and Mathematical Sciences 4
Friday, March 1, 2019, 11:00 am
Location: Aztlan

219 11:00 am

Quark Matter in the Cores of Neutron Stars

Delaney Farrell, Physics (U)

Neutron stars are super-dense remnants of massive stars that blew apart in catastrophic supernova explosions. They are typically around 20 kilometers across and spin rapidly, often making many hundred rotations per second. Depending on mass and rotational frequency, gravity compresses the matter in the core regions of neutron stars to densities that are several times higher than the density of ordinary atomic nuclei. A thimble full of neutron star matter would thus have a mass of one billion tons! At such extraordinary densities atoms themselves collapse, and atomic nuclei are squeezed so tightly together that neutrons and protons begin to dissolve into their constituents, the quarks. This research project explores such a phase transition within the cores of neutron stars. Particular emphasis is put on the possible existence of quarks in the cores of rotating neutron stars. In contrast to non-rotating neutron stars, whose particle compositions do not change with time (are frozen in), the type and structure of the matter in the cores of rotating neutron stars depends critically on the spin frequencies of these stars. This opens up a new window on the nature of matter deep in the cores of neutron stars. Our study shows that, depending on mass and rotational frequency, up to around 30 percent of the mass of a massive neutron star may be in the quark phase.

220 11:15 am

The Speed of Sound in Ultra-Dense Matter

Aksel Alp, Physics (U)

In the classical physics of very dense matter, Lorentz invariance imposes no restriction on the speed of sound or on the ratio of pressure to energy density. As a consequence, classical many-particle theories which show a normal behavior at low densities become super-luminal (speed of sound greater than the speed of light in vacuum) and ultra-baric (pressure greater than energy density) at high densities, contradicting Einstein's theory of Special Relativity. On the other hand, relativistic quantum mechanical theories of many-particle systems should be neither super-luminal not ultra-baric. In this paper we study whether or not this is true for the relativistic quantum-mechanical mean-field model, which is widely used in the literature to explore the properties of ultra-dense matter in the cores of collapsed stars and produced in relativistic particle collisions.

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221 11:30 am

Composition of Proto-Neutron Star Matter

Ian Maloney, Department of Physics (U)

Newly formed neutron stars, known as proto-neutron stars (PNSs), are superdense as well as superhot stellar objects. They are much denser than atomic nuclei and their temperatures immediately after birth in type-II supernova explosions are between around 500 to 800 Billion degrees Kelvin. At such extreme conditions of density and temperature, neutrons, protons and electrons are no longer the only fundamental building blocks of matter. Instead they are accompanied by new particle degrees of freedom such as thermal bosons, hyperons, delta particles, and possibly even quarks. Here we present the results of detailed numerical calculations of the structure and the equation of state of PNS matter. Knowledge of the latter is of fundamental importance for the theoretical modeling of proto-neutron stars.

222 11:45 am

Probing the Circumgalactic Medium at z~2 using Close Quasar Pairs

Stephanie Stawinski, Astronomy (M)

The Circumgalactic Medium (CGM) is the gas that surrounds the disk of galaxies. It is enriched by outflows driven by active star forming regions in the host galaxy as well as the inflow of gas from the nearby Intergalactic Medium and neighboring galaxies. These inflows and outflows are essential to understanding galaxy formation and evolution. However, there are very few observations of the chemical content of the CGM beyond the local universe. In this project, we use a novel approach to study the CGM of galaxies at about a redshift of 2, or 3.3 billion years after the Big Bang. We study the metal content by measuring the absorption of light passing through the CGM from a background light source. We use pairs of bright quasars that are close to each other on the sky to identify high-redshift foreground galaxies in absorption along one of the quasar sightlines. We then use the light source provided by the second quasar in each pair to probe the nearby CGM. In this project, we measure the abundance and kinematics of the metals in the CGM of about 40 galaxies. We present our results including column density maps of the metals at different distances into the CGM, up to 300 kpc from the host galaxy. This analysis will further our understanding of the distribution of metals around galaxies, thus providing insight into the metal-enriched gas flows which drive galaxy formation.

223 12:00 pm

Dense Matter Calculations with the Relativistic Hartree-Fock Method

Ezra Hart, Physics (M)

The realistic modeling of nucleonic quantum gases made of neutrons and protons is of fundamental importance for our understanding of atomic nuclei, heavy ion collisions, catastrophic stellar events (supernova explosions), and superdense stars. We are modeling such quantum gases in the framework of the relativistic Hartree-Fock method, which is based on a field-theoretical Lagrangian where neutrons and protons interact via the exchange of mesons. The highly nonlinear field equations were solved by making use of the Greedy Grid search method. Using this method, we were able to calculate key properties of nucleonic gases such as single particle energies, the mass operator, and the equation of state (pressure as a function of density). Knowledge of these quantities is critical to carry out research on the nuclear and astrophysical systems mentioned above.

Session B-5

Oral Physical and Mathematical Sciences 5
Friday, March 1, 2019, 11:00 am
Location: Metztli

224 11:00 am

Healthcare

Mariam Mikava, Computer Engineering (U)

Our research refers to healthcare and medicine. We want to design a device which monitors human pulse and saturation. A person with a high risk of heart disease can use this device as a control system of his/her heart rate and saturation. The device will save all the information in the database. And the user can see how the pulse and saturation level changed time by time in our application. This is helpful not only for the user but for doctors to track the pulse and saturation on high-risk patients. We also want to design the alarm system in our application which will be very useful during sleeping time. When either pulse or saturation is critically changed it should send the signal to the emergency. Now we are making researches on diseases. We are looking for correlations between oxygen level in blood and heart/brain attacks. We saw data how many people are dead because of a brain/heart attack during sleeping time. We are trying to do some research first to find out the critical heart and saturation rates before the heart attack, also what heart rate and saturation are best for different kind of activities. So, the aim of our research is to reduce fatal statistics by determining the danger before the several hours of the possible attack.

225 11:15 am

Evaluation of an artificial pulse for Left Ventricular Assist Devices

Sean Ortiz, Mechanical Engineering (U)

Left ventricular assist devices (LVADs) are mechanical pumps that are implanted to treat heart failure, but clinically exhibit a 10.8% incidence of stroke. To reduce this complication, one LVAD, the Heartmate 3, has introduced an artificial pulse that is intended to improve the cardiac fluid dynamics of blood. The goal of this study was to measure the effect of the artificial pulse on flow and vortex dynamics of the LVAD-supported left ventricle (LV) in a mock circulatory loop.

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Experimental studies were performed with a silicone model of a dilated LV and a rotary flow LVAD (Abbott Labs, Chicago IL). A LaVision PIV system measured the hemodynamics and the 2-D velocity field of the LV midplane for the cardiac cycle (40Hz). A range of LVAD speeds were tested from 4.8 to 6.4krpm, with the artificial pulse produced every 2s. Velocity fields were analyzed for regions of interest (ROI) adjacent to the LVAD inflow cannula. Vortex circulation and kinetic energy (KE) were computed during the cardiac cycle using the Q criterion to identify the vortex boundaries.

The Pre-LVAD condition simulated a heart failure patient with a MAP of 58 mmHg and cardiac output of 2.5 L/min, resulting in an ejection fraction of 19.8%. CW vortex circulation and kinetic energy (KE) (16.4m/s and 13.2J/m) were greater than CCW values (2.62m/s and 2.53J/m, respectively). LVAD flow increased to 3.4L/min at 4.8krpm and to 4.4L/min at 6.4krpm, accompanied by increased MAP and reduced pulsatility. ROI results showed improved washing of the LV at all LVAD speeds. The KE increased by 33% and 72% for the CW and CCW vortices from no LVAD support to 4.8krpm. The KE further increases by 15% and 1% for the CW and CCW vortices from 4.8krpm to 6.4krpm.

The artificial pulse of the LVAD improves fluid and vortex dynamics in the LV by improving pulsatility and KE. The artificial pulse does not alter the overall hemodynamic benefit of LVAD support or produce aortic valve opening in the absence of cardiac contraction. Based on these findings, it is predicted that the artificial pulse reduces the risk of thromboembolic complications.

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226 11:30 am

Development of a non-invasive muscle force sensor

Rene Arvizu, Mechanical Engineering with Bioengineering emphasis (U)

Introduction

Assessment of in vivo muscle function is a prevailing challenge that limits clinical evaluation of muscle health because in vivo measurement of muscle force currently requires invasive surgical testing. Shear wave elastography is a new non-invasive technology that shows potential for measuring muscle force based on demonstrated linear relationships between muscle force and stiffness. Unfortunately, current elastography systems are limited by their clinical use, which has a very low frame rate (1 Hz) and precludes measurements during gait. We propose to develop custom, miniature ultrasound probes, capable of accurately calculating muscle stiffness in vivo during the gait cycle.

Methods

We developed custom ultrasound probes capable of producing a focused ultrasound beam. To measure the safety of the design for use on human tissue, one ultrasound probe was placed in a water tank with a hydrophone directly under the probe. Using the hydrophone, we measured the instantaneous and average power of the ultrasound waves at different positions and compared against FDA published power limits.

To simulate human tissue, we created gels of agar and Metamucil, a fiber supplement, which provided similar stiffness and echoic properties to human tissue.

We used a DC vibrating motor to propagate shear waves across our simulated tissue and between two ultrasound probes placed on the tissue. We designed processing software for extracting shear wave measurements from the ultrasound echo data.

Results

Using a pulsing amplifier to trigger the ultrasound probe, a 40 Volts stimulation and a dampening of 8.4 dB or 10 dB were sufficient to meet the FDA standards of safety, while producing a strong ultrasound echo signature.

Using the simulated tissue, we were able to observe tissue movement from the ultrasound echo data and demonstrate the measurement of shear wave speed between the two probes.

Conclusion

We have demonstrated proof of concept of an ultrasound system for measuring muscle function. In future work, we will demonstrate the capability of the system to accurately measure muscle stiffness.

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227 11:45 am

Bilayer Passive/Active Polymer Protective Armors

Sterlen Barnes, Mechaniclal Engineering (M)

Low energy impacts are ubiquitous in our daily lives in activities such as walking, running, jogging, or other action sports. A common approach to reduce the severity of incoming impacts is adding protective foam paddings between the human body and the source of impact. Polymeric foam has had a long and extensive history in many applications due to high energy dissipation ability with low weight penalty. The ability of polymeric foams to absorb energy stems from high degree of reversible compressibility. The objective of the research is to investigate the technical feasibility of a bilayer novel structure consisting of a layer of a semi-closed, self-reinforced polyurea foam and a thin layer of electroactive dense polymer. The former is used to dissipate energy through mechanical strain energy, while the latter (i.e., Polyvinylidene Fluoride, PVDF) will convert a portion of the incoming impact energy into an electrical energy. The methodology implemented is to first characterize the polyurea foam and PVDF separately. Thereafter, a composite consisting of the two materials is tested in two configurations; namely up-orientation where PVDF is facing the incoming impact and down-orientation where the PVDF is far from the impact. Regardless of the material system or orientation, the quasi-static testing using standard 1kN load frame and dynamic testing using impact tester are used to elucidate the mechanical response. The amount of energy dissipated is then associated with mechanical deformation (strain energy) and electrical energy (electroactive aspect of PVDF). The results can used to optimize sporting equipment by balancing between the thickness of foam and electroactive polymer, respectively.

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228 12:00 pm

A 500 pW Analog ECG Processor for Real Time R-wave Detection Based on Pan-Tompkins Algorithm

Cihan Gungor, Electrical & Computer Engineering (D)

Noninvasive health monitoring applications necessitate real-time, accurate, and energy-efficient computation of health-related parameters. Electrocardiogram is one of the most widely used signals to assess the risk of cardiovascular diseases (CVD), the dominant cause of death worldwide; as well as autonomic nervous system (ANS) health through heart rate variability (HRV). R-waves are critical features for cardiac automatic health assessment. In this study, an energy-efficient application specific integrated circuit (ASIC) processor for real-time R-wave detection is presented. For reducing the processing power consumption without compromising precision, the processor leverages analog/physical computation principles to implement an algorithm based on the Pan-Tompkins (PT), which offers high R-wave detection precision. The processor is designed in a 65 nm CMOS technology and eliminates the power consumption related to digitization by operating in the physical domain. Furthermore, the analog blocks facilitate CMOS subthreshold region and current-based computing for power efficiency as well as simplicity, which improves the area consumption. The simulation results of the proposed processor using ECG signals from MIT-BIH arrhythmia database are evaluated based on the actual annotated R-waves of the database. The processor detects R-waves with average sensitivity and positive predictive values of 98.98% and 98.9%, respectively. The proposed processor consumes 500 pW when supplied by 1 V.

229 12:15 pm

Aortic insufficiency during Left Ventricle Assist Device support: a mock loop study

Vi Vu, Mechanical Engineering (D)

Aortic valve (AoV) insufficiency (AI) is a serious complication in more than 20% of Left Ventricle Assist Device (LVAD) patients. Normal AoV have developed AI following long-term LVAD support, which has been associated with a significant reduction in patient survival. During LVAD support, the AoV pressure difference is increased, which reduces systolic opening and worsens regurgitant flow through an incompetent valve. The goal of this study was to measure the effect of LVAD support on intraventricular flow during AI.

The velocity field was measured in the mid-plane of a dilated silicone LV model attached to a rotary LVAD (Abbott Labs, IL) in a mock circulatory loop. A Pre-LVAD without AI condition (BL) of 20% ejection fraction was established, followed by testing at three LVAD speeds. AI was created with a small 3-D printed stent which was non-obstructive to forward flow but prevented the leaflets from fully closing. LV and aortic pressure, and LVAD and distal aortic flow, were recorded; while stroke volumes (SV) were calculated from the integral of measured flow. An in-house MATLAB program was used to detect and characterize the size and velocity of the regurgitant jet (RJ) from the measured velocity field.

AI reduced cardiac output by 25% for the pre-LVAD condition, resulting in a regurgitant fraction (RF) of 33% which is considered mild-moderate AI. As LVAD support increased from Low to High, total flow increased by 40-82%. AI reduced these values by approximately 28%, and increased the RF to 38-40% (moderate-severe AI). The RJ enlarged during diastole and persisted longer until mid-late systole. Overall, the RJ properties (area, vena contracta, length, and velocity) increased as LVAD support increased, and the total SV during diastole and systole decreased when AI was present.

The results showed that an initially mild level of AI worsened with LVAD support prior to any remodeling, simply due to the altered biomechanics of the AoV. These findings provide a foundation for new LVAD control strategies that can restore the AoV biomechanics and reduce the impact of AI on patients with LVAD support.

Session B-6

Oral Behavior and Social Sciences 5
Friday, March 1, 2019, 11:00 am
Location: Templo Mayor

230 11:00 am

Variation in Communication Style Across Spanish- and English-Speaking Parent-Child Dyads During Free Play

Allyson Masters, Psychology (M)

In parent-child engagement, both quality (Hirsh-Pasek et al., 2015) and quantity (Weisleder & Fernald, 2013) of language input are positively associated with vocabulary. However, in our recent study (Masters et al., 2018), we found that Spanish-speaking dyads use fewer examples of rich symbolic engagement during free play relative to their English-speaking peers. Importantly, rich symbolic engagement is positively related to early vocabulary. What other characteristics of parent-child engagement can help to clarify this pattern in our Spanish-speaking sample?

We examined two communicative strategies common in speech to young children: Recasts/Expansions and Redirects. Recasts/Expansions are positively associated with vocabulary (Farrar, 1992; Tomasello, 1992), whereas Redirects are negatively associated (Tomasello & Farrar, 1986). We expected that Spanish-speaking parents would engage in fewer recasts and expansions but more redirects relative to English-speaking parents.

Participants were 50 Spanish- and 50 English-speaking parent-child dyads from our original study, of which we present a preliminary sample of 34 Spanish (15 girls, Mage=31;14, range=28;18 to 37;6) and 35 English (20 girls, Mage=30;7, range=28;0 to 32;21). Dyads participated in 20-minute free play sessions and parents completed the MCDI:WS, a measure of expressive vocabulary. Conversations were transcribed to inter-rater agreement=.90 and coded to inter-rater

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agreement=.87.

The Spanish-speaking sample was characterized by lower parent education and child expressive vocabulary than the English-speaking sample ($t(52.88)=52.88$, $p<.001$ and $t(63.09)=5.96$, $p<.001$, respectively). However, the number of conversational turns did not differ across samples (Ms=309.41 and 314.14, respectively, $p=.858$). Overall, Recasts/Expansions were significantly correlated with expressive vocabulary ($r(69)=.489$, $p<.001$). Redirects were not. However, Language group was significantly correlated with Recasts/Expansions ($r(69)=.530$, $p<.001$) and with Redirects ($r(69)=-.238$, $p<.001$) such that, consistent with our prediction, Spanish-speaking parents used fewer recasts and expansions but more redirects relative to their English-speaking peers.

In previous research, we found that Spanish- and English-speaking dyads engage differently during free play: both groups use rich symbolic engagement but this effect was attenuated in our Spanish-speaking sample. The present study clarifies these findings by identifying one source of this attenuation. Specifically, opportunities for rich symbolic engagement may be reduced in the Spanish sample by the presence of a high rate of parent redirects.

231 11:15 am

A Comparison of Vaccination and Hospitalization Among Pediatric Pertussis Cases in California By Language of Interview

Sandra Yun, Master of Public Health (M)

Introduction: During the 2014 outbreak in California, 72% of pertussis cases were among Hispanic infants under 4 months of age. Hispanic infants were not only more likely to be infected with pertussis but were also more likely to be hospitalized or die. Children born to foreign-born parents are at higher risk of adverse events due to the lack of healthcare utilization and health knowledge.

Objectives: The purpose of this study was to investigate the rates of hospitalization and Tdap vaccination among pediatric pertussis cases by the mother's language.

Methods: Data from the California Department of Public Health on pediatric (0-17 years old) pertussis cases from 2011- 2015 was used for this study. The language of the interview was used as a proxy for foreign-born status. Chi-Square tests were conducted to determine the significant difference in the proportion of hospitalization and vaccination among those whose mothers spoke English or Spanish during the interview. These were further compared by specific age categories.

Results: The sample included 8,443 cases that had complete data on language, 3,009 0-6 year olds and 5,434 7-18 year olds. Among the 0-6 year olds, Spanish-speakers were significantly younger than the English-speakers ($p=0.001$). When stratified by age, Spanish-speakers had a higher proportion of vaccinated individuals except for in children under four months even though they had a higher proportion of hospitalization. When further analyzed among Hispanic children, those born to Spanish-speaking mothers were more likely to be hospitalized as well. Among 7-18 year olds, children born to Spanish speakers were also significantly younger than English-speakers were. Vaccine coverage among Children 7-18 was very high overall (>90%) but Spanish- speakers had a significantly higher proportion of vaccinated children across all age categories than their English speaking counterparts ($p<0.0001$).

Conclusions: With the exception of children under 4 months, children born to Spanish speaking mothers were more likely to be vaccinated but were also more likely to be hospitalized. Greater efforts into increasing vaccination among foreign-born mothers during pregnancy and among children at the recommended 2 months would greatly decrease the risk of death and hospitalization.

232 11:30 am

The role of working memory and cognitive control in online sentence processing: A comparison between bilingual and monolingual speakers

Niloofar Akhavan, Language and communicative disorders (D)

Bilingualism can be simultaneously associated with lower linguistic processing skills (e.g., Sandoval et al., 2010) and enhanced nonverbal executive function abilities (e.g., Bialystok, 2005, 2007). Yet, it is unclear how a bilingual speaker performs under conditions where the collaboration of both systems is required. In this study, we compared bilingual and monolingual speakers in resolving similarity-based interference during online sentence processing. In addition, we examined the relation between online parsing performance of groups with respect to their working memory and cognitive control skills to understand if bilinguals show different reliance on their executive abilities to process complex sentences.

In this eye-tracking-while-listening [ETL] study, object- and subject-relative sentences were aurally presented to 17 bilingual and 19 monolingual speakers while gaze patterns were captured throughout the time course of the sentence. Of particular interest was the post-verb position, where the listener connects the verb to its direct object. In object-relative constructions (e.g., "The man that the boy pushes__ has a red shirt."), linking the verb with its syntactically licensed direct object occurs by 'crossing over' an intervening noun phrase, creating similarity-based interference (Gordon, Hendrick, & Johnson, 2001). The nature of the ETL paradigm allows us to measure the interference effect between the intervening noun phrase and the displaced object and its resolution in real time. Moreover, by means of two versions of N-back tasks, we explored group differences in working memory (no-conflict N-back) and cognitive control (high-conflict N-back).

Preliminary data analyses suggest that the bilingual listeners will demonstrate a smaller interference effect than the monolingual participants. We believe that both groups will demonstrate some interference but that the bilinguals will show a smaller effect, which will be correlated to stronger cognitive control skills. This study thus allows for a detailed investigation of real-time processing of complex sentence constructions along with an exploration of the interactive effects that bilingual's cognitive skills on sentence comprehension.

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233 11:45 am

Can bilingual children capitalize on cross-language similarities to learn new words?

Quynh Dam, Language and communication disorders (D)

For bilingual children, improving cognate awareness - the ability to recognize words that share similar form and meaning (i.e. sofa in English and sofá in Spanish) - can be an effective strategy for learning vocabulary across two languages. A study on typically developing (TD) bilingual children (Pham et al., 2017) showed that children with high Spanish proficiency were able to utilize cognate awareness to learn new words in Spanish and transfer their knowledge to English. The present study extends prior work to an educational intervention that explicitly teaches the metalinguistic concept of cognates to bilingual children with and without Developmental Language Disorder (DLD). We asked whether bilingual children with and without DLD could improve on measures of target vocabulary and cognate awareness, and whether increasing cognate awareness improved their vocabulary development. Twelve children (6 DLD, 6 TD), aged 6 to 8 years, completed a six-week intervention program, 3 days per week, for 90 minutes per day. Intervention was conducted in Spanish and focused on teaching vocabulary and cognates using books, educational software, and board games. Target vocabulary consisted of 32 words (8 words per book x 4 books). Children were asked to identify and define the target words and use the words to formulate sentences and retell stories. Children worked in dyads (i.e. one DLD and one TD) with a bilingual graduate research assistant under the supervision of a licensed speech-language pathologist. Change was assessed via vocabulary gains (measured by definition quality [Pham et al., 2017]) and cognate awareness (measured by performance on a cognate-based picture naming task [Sheng et al., 2016]). Results showed that 7/12 participants (2 DLD, 5 TD) showed improvement on the target vocabulary words, and 9/12 participants (4 DLD, 5 TD) showed improvement on cognate awareness. TD children showed a positive relationship between increased cognate awareness and vocabulary gains, whereas children with DLD did not. Findings strengthened understanding of the relationship between cognate awareness and vocabulary development and contributed to the knowledge base on treatment for bilingual children with DLD.

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234 12:00 pm

An Electrophysiological Investigation of Cognitive Processing During Word Learning in Bilingual School-Aged Children

Cristy Sotomayor, Language and Communicative Disorders (D)

The extant literature offers mixed findings regarding whether speaking two languages leads to enhanced cognitive abilities due to the restructuring of the neural circuits involved in language and cognitive processing. However, the previous research primarily utilized behavioral outcomes, which assumes that comparable behavioral data across groups signifies a similar underlying neural mechanism. The present study expands on the extant literature by utilizing both behavioral and electrophysiological measures to examine word learning in monolingual and bilingual children, considering SES and language proficiency. Here we focus on school-aged children because of critical changes in their vocabulary acquisition during this period.

For this study, children completed standardized language and cognitive assessments as well as an experimental word learning task, during which their electroencephalogram (EEG) was recorded. During the word learning task, children read grouped sentences that introduced a novel word and were asked to identify the meaning of the new word, if possible.

For behavioral outcomes, we expect the bilingual children to perform comparably to monolingual children when controlling for SES and language proficiency. Conversely, we expect the electrophysiological results to differ across the language groups. This pattern of findings would suggest that each group uses different underlying neural mechanisms during vocabulary acquisition, yet they achieve similar outcomes. This would reveal how language experience correlates with underlying neural networks in school-aged bilinguals and would offer insight into appropriate methodology future research on this topic should utilize.

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235 12:15 pm

Is a dog closer to a wolf or a bone? : Comparing taxonomic and thematic semantic relationships

Elizabeth Anderson, Language and Communicative Disorders (D)

Words that belong to the same overarching semantic category have a taxonomic relationship, such as dog and wolf from the overarching category of animal. Words that are related by “co-occurrence in events or scenarios”, such as dog and bone have a thematic relationship. These different word relationships are thought to provide information about different stages of word processing. In particular, taxonomic and thematic relationships between words may allow us to examine the processes of lexical-semantic access and lexical selection during language production. To prepare for an upcoming picture-word interference EEG language production study, we conducted a norming survey to gather relatedness ratings for pairs of taxonomically and thematically related prime and target words. 41 participants each rated 178 out of 356 pairs (89 taxonomic and 89 thematic) on a 7-point Likert scale (7 = strongly related), for a total of approximately 10 ratings for each word pair.

The characteristics of the chosen words as well as the overall difference in strength of relatedness between taxonomic and thematic pairs may influence the behavior and/or ERP activity observed in participants. Therefore, we compared characteristics such as word length, frequency, concreteness, and target-prime relatedness across our word lists.

We found no statistical difference based on word length amongst our targets, taxonomic primes, or thematic primes. There was no statistical difference in frequency between taxonomic or thematic primes, although target words were found to be more frequent than both types of primes. Target

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words and taxonomic primes were found to be significantly more concrete than thematic primes.

Most notably, survey participants rated thematic primes as more highly related to the target words than taxonomic primes. This difference in rating was statistically significant, even after we removed any word pairs that had an average relatedness rating below 5.5 on the 7-point Likert scale.

This norming study data is important for the selection of related words pairs in the upcoming priming study so that any observed differences between targets with taxonomic versus thematic primes cannot be attributable to differences in concreteness or relatedness.

Session B-7

Oral Behavior and Social Sciences 6
Friday, March 1, 2019, 11:00 am
Location: Visionary Suite

236 11:00 am

Cultural Influences of Lung Cancer Risk Among Young Sexual Minority Latino Men

David Rivera, Psychology (U)

Introduction: Latino Sexual Minority Men (SMM) have high rates of cigarette smoking in comparison to their heterosexual, and non-Latino counterparts. For instance, Latino SMM in California reported smoking prevalence of 41.8% within the last 30 days compared to 20.1% of heterosexual Latino men, and 27.8% of white SMM. Despite these high rates, limited research has investigated correlates of these smoking behaviors in this vulnerable population. Machismo and caballerismo are separate components of masculinity in Latinx culture. Machismo is akin to hypermasculinity, and has been previously associated with a greater likelihood of illicit drug use, intimate partner violence, and HIV sexual transmission risk behavior. Caballerismo is associated with strong family values. High levels of machismo may be related to difficulty expressing emotions, leading to a reliance on avoidant coping strategies to regulate negative affect, such as smoking. Thus, the current study aims to investigate the association between machismo, caballerismo, and cigarette smoking among young Latino SMM.

Method: Participants were 151 Latino SMM recruited from the San Diego area (M = 24.18 years old, SD = 3.19). Participants completed an online self-report questionnaire in either English or Spanish, which included The Machismo and Caballerismo Scale used to assess traditional machismo and caballerismo. Participants also indicated the number of cigarettes they smoked per day. Two binary variables were created: smoking 1+ cigarette/day vs. no smoking, and 10+ cigarettes/day vs. less than 10 cigarettes/day. Two binary logistic regression models were conducted, using traditional machismo and caballerismo as predictors of any smoking, and smoking 10+ cigarettes a day.

Results: Traditional machismo was associated with greater odds of smoking 1+ cigarette/day (OR: 3.81; CI: 2.27, 6.42; $p < .001$), and greater odds of smoking 10+ cigarettes/day (OR: 2.04; CI: 1.40, 2.96; $p < .001$). The association between caballerismo and smoking was non-significant.

Conclusion: Latino SMM with high levels of machismo as part of Latinx culture are at elevated odds for any cigarette smoking, and moderate levels of smoking (at least 10 cigarettes per day). Smoking prevention and/or cessation programs with this vulnerable population may wish to address traditional machismo as part of the treatment package.

237 11:15 am

A qualitative introduction to understanding cultural beliefs and health care utilization in rural Paraguay

Jennifer Beckner Schneider, MA Latin American Studies; MPH Health Promotion & Behavioral Studies (M)

Paraguay is one of the least urbanized nations in South America. This largely rural population suffers greatly from high rates of diabetes, parasitic infections, and other diseases. Due to the extreme lack of public health research in Paraguay, introductory research is necessary to better understand the sociocultural influences on the health behaviors of Paraguayans as well as to determine specific areas of focus for further research. With funding from the Tinker Grant for preliminary research, I conducted reconnaissance research to determine the feasibility and viability of conducting further studies on culture bound beliefs and health decision making in rural Paraguay. I conducted unstructured interviews with medical professionals and community members about health issues affecting the community in Santa Maria, Misiones, then coded and qualitatively analyzed the interviews using thematic analysis. Recurring topics of importance included patient-provider trust, health needs, superstition, and motivation. Furthermore, four different routes of treatment-seeking were identified, and the use of traditional medicine and healers was highlighted as important by many members of the community. The results from this preliminary study have helped to inform the development of a more structured qualitative interview guide for a future research endeavor that will focus more specifically on how exactly individuals make decisions about where, when, and how to seek health care, focusing specifically on factors that influence individuals' decision-making process in health care utilization. This future research could be clinically relevant in both Paraguay and with immigrants in the US.

238 11:30 am

Are Mexican-origin young adults living in an urban community more likely to have accessed dental care in the last year than those living in a rural community?

Sandra Oliva, Public Health - Health Management and Policy (M)

Purpose: To examine past year dental access and utilization among low-income, young adults of Mexican-origin in urban and rural communities.

Methods: Survey data were collected from Mexican-origin

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young adults, aged 21-40, recruited from urban northern San Diego County (SD) and rural Imperial County (IC) from August-November 2018 (N=72). Recruitment occurred via in-reach at partner clinics and outreach at community events. The survey included questions about health system access and utilization, in addition to self-reported oral health status and socio-demographic information. The Andersen Behavioral Model of Health Services Utilization served as the framework guiding analysis. The model posits predisposing factors (socio-demographics), enabling factors (clinic patient status, site, insurance status, and having a dental home), and need factors (self-perceived need for care) affect likelihood of utilization. The outcome of interest was whether or not individuals had a dental visit within the last year. Univariate and bivariate (Chi-Square) descriptive statistics were calculated. This is a work in progress: modeling through logistic regression is the next step.

Results: The average participant age was 31 (SD=6.50). The sample consisted of 46% males and 51% clinic patients, and 44% were from SD, while 56% were from IC. Almost half (46%) did not have dental insurance. Although most (75%) had a dental home, many (71%) said they were in need of dental treatment. Only 49% of participants had a dental visit within the last year.

Bivariate results indicated that those living in an urban community in SD were not more likely to have had a dental care visit in the last year than those in rural IC (p=0.8330).

Conclusion: Although there was no difference in access to dental care in the last year between those living in urban SD and those living in rural IC, it remains critical to measure past year dental care utilization, as it is a Leading Health Indicator for oral health.

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239 11:45 am

Oral hygiene behavior change among Mexican-origin adults after U.S. Migration

Mireya Mateo-Gomez, Public Health and Latin American Studies (M)

Purpose: The purpose of this study was to qualitatively explore how migration to the United States (U.S.) influenced Mexican-origin adults' oral hygiene behaviors.

Methods: A semi-structured interview guide was created in English, independently translated to Spanish by three bilingual translators experienced in health studies, then compared and refined by the investigator team for cultural linguistic equivalence. Five bilingual interviewers (4 women, 1 man) were trained and conducted individual interviews with 72 Mexican-origin young adults, ages 21-40, in San Diego and Imperial counties, CA, in either English or Spanish. Participants were recruited via clinic in-reach and outreach at community events during August-November 2018, to achieve a diverse but balanced sample across sex (male/female), primary language (English/Spanish), and marital status (single/married). There were 32 participants from northern San Diego; 20 of those participants self-identified as being born in Mexico and were included in this analysis. Thematic analysis was conducted through hand-coding and iterative review by the three San Diego site interviewers. Each interviewer reviewed their transcripts to identify themes relating to migration and oral hygiene behaviors. Once common themes were identified, the team met biweekly to ensure trustworthiness of the themes, common in qualitative research.

Results: Of 20 participants, their average age was 34 (range=21-40), 60% were married, 80% Spanish-dominant, 40% male, and 50% were clinic patients. Preliminary results indicated that 50% of participants born in Mexico reported a change in their oral hygiene behavior after migrating to the U.S. Changes included increased use of dental floss and mouthwash, while brushing remained part of their usual routine. Male participants reported engaging in additional oral hygiene behaviors after learning about different dental products from dental providers and mass media. Additionally, many men described the main reasons for their routine change and adoption of new oral health behaviors was due to their occupation and economic stability in the U.S.

Conclusion: Among Mexican-born Spanish-speaking males in our sample, migration to the U.S. was described as a main reason for their increased access to dental products, increased knowledge of how to use floss and mouthwash, and starting these behaviors in addition to brushing.

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240 12:00 pm

Correlates of Ciclovía Participation in Bogota, Colombia

Maria Esther Camargo Diaz, Master's in Public Health and M.A. in Latin American Studies (M)

Background: Physical inactivity is a major public health concern worldwide. The World Health Organization recommends that individuals engage in 150 minutes of physical activity per week. Public health researchers have stated that urban societies are increasingly physically inactive even though there is evidence of the health benefits in exercising. They also note that making changes to the urban environment provides residents with equitable and convenient access to spaces for physical activity and is a good strategy to promote physical activity.In Latin America, many urban cities have implemented a program called Ciclovía to engage the community in physical activity and provide a sense of social cohesion. Ciclovía, Open Streets, is a mass recreational program that opens streets in a city for use by the community to walk, bike, skate, run or participate in exercise classes. The Tinker Grant gave me the opportunity to travel to Colombia to speak and make connections with public health researchers that are leading the Ciclovía research efforts.

Purpose: The purpose of this study was to examine and identify the factor that encourage or discourage the residents of Bogota, Colombia to engage in physical activity in the Ciclovía program. Many studies have analyzed the Ciclovía program to determine if it is a viable program to increase physical activity, but this study focused on exploring the factors that contribute to participation in the program.

Methods: This is a multi-level cross-sectional, secondary data analysis examining which factors are associated with participation rates in the Ciclovía program. This analysis will

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use data from the International Physical Activity Environment Network (IPEN) study in Bogota, Colombia. IPEN survey data was collected between 2010-2011. The sample size for this survey was n=1000 participants. The International Physical Activity Questionnaire (IPAQ) was used to collect leisure-time PA. IPAQ in Latin American (LA) countries was adapted using a script for interviewer-based administration and also had culturally-appropriate language modifications for each LA country.

Preliminary Results: Of 1000 participants, the average age was 41 (range 18-70), 63.70% were female and 53% were married or living as married. Further analysis, will be discussed at the symposium.

241 12:15 pm

Relationships of Sleep Duration and Variability with Overall Physical Activity in the Hispanic Community Health Study/Study of Latinos Sueño Ancillary Study

Kimberly Savin, Clinical Psychology (D)

Sleep duration and timing influence risk of obesity, diabetes and other cardiometabolic disorders. Overall physical activity (PA) may be an important variable in the pathway from sleep to health outcomes. While some studies link both short and long sleep durations with increased health risk, limited research suggests that sleep variability, or the intra-individual inconsistency in sleep duration or timing also has health implications. Among Hispanic/Latino adults, we examined cross-sectional relationships between (1) sleep duration and PA and (2) variability in sleep duration and timing with overall PA.

The Hispanic Community Health Study/Study of Latinos (HCHS/SOL; 2008-2011) is a population-based cohort of 16,415 self-identified Hispanics/Latino adults from four urban US communities. The Sueño ancillary study recruited N=2218 participants (43.0% male; mean age=42.0 yrs) who provided demographic and health information and wore wrist actigraphy devices for ≥5 days to objectively measure sleep and PA. Sleep duration was the total time between sleep onset and offset. Sleep variability was the standard deviation of a participant's nightly sleep durations and sleep midpoints (clock time midway between sleep onset and offset). PA was the average activity count/min in active (non-rest) intervals.

Mean sleep duration was 7.6 hrs (SE=.03) and 38.5% obtained the recommended 7-8 hrs of sleep. Mean variability in sleep duration was 1.4 hrs (SE=.02) and mean variability in sleep midpoints 1.0 hr (SE=.02). Multivariable linear regression models that adjusted for demographic and health factors, complex survey design and sampling weights revealed that longer sleep duration linearly related to lower PA (B=-.130, p=.001). Variability in sleep duration was not associated with PA (B=.126, p=.081). Variability in sleep midpoints had a small but statistically significant, positive association with PA (B=.002, p=.026).

Among Hispanic/Latino adults, average sleep duration was within the recommended range but variability in durations and midpoints was high. Surprisingly, findings suggest that shorter sleep duration and greater variability in sleep midpoints were associated with higher levels of PA. Further research regarding sleep variability, its associated social/occupational factors, and its relation to health behaviors and outcomes is warranted to better inform prevention efforts.

Session B-8

Oral Behavior and Social Sciences 7
Friday, March 1, 2019, 11:00 am
Location: Legacy Suite

242 11:00 am

Impact of Hand-Held Media on Child Food Consumption

Salvina Rondoni, Child and Family Development (U)

Background. The increase of readily available and easily accessible technology is changing the way humans interact with the world and one another. Only one study has assessed the role of these changes in public environments (Radesky et al., 2014). The study concluded that higher levels of absorption lead to harsher responses to child misbehavior. It is logical that patterns of greater absorption in technology would impact a parent's observations, prompts, and decisions regarding a child's food consumption.

Objective. While some investigation has been conducted on the role of digital media in parent-child interactions in restaurants, to date, no research has assessed whether the child's use of media impacts the child's food consumption, food choices, and parent-child interactions surrounding the child's food intake.

Hypothesis. We hypothesized that if children engaged with hand-held media devices, there would be (1) a decrease in the amount of food the child consumed and, (2) an increase in the time it took for the children to finish the meal.

Method. Thirty-five parent-child dyads were observed in a casual dining restaurant setting. Observers researched 80% reliability on coding categories prior to beginning data collection. Subjects gender, group size, child seating type (i.e., car seat, high chair, booster, independent seating) and relative health of their meal was recorded using a pre-established code. Data was collected in 5-minute intervals for the duration of the dining experience. Data collected included rate of consumption by each individual, percentage of media use, qualitative assessment of the quality of parent-child interaction, and detailed narrative description of all behavior during the interval.

Results. By using a qualitative approach, we highlight themes within the data that point to areas for further study such as, (1) the impact of hand-held devices on healthy diet choices (type of food, rate of consumption). (2) Patterns in parent-child interactions around food (e.g., parent prompts firm/harsh) when media is present. Descriptive statistics will be reported regarding rates of child media use at the table, quality of parent prompts, and rate of child food consumption with and without media.

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243 11:15 am

"I can see the disappointment in her face": Communicative Patterns in Disclosing Childfree Status between Mothers and Daughters

Evelyn Puga, Communication (M)

Women now more than ever are choosing to not have children. This choice violates society's expectations of what a woman should do. Because of this violation, women have to provide justifications for their childfree choice. This research engages in thematic analysis to identify the different strategies that childfree women use when communicating their choice with their families, in particular, their mothers. Ten women were interviewed with open-ended questions about their choice and how they shared this information with others. The results reveal that not only do childfree women use strategic timing and strategic placing when sharing this information, but so do their mothers. Ultimately, the research reveals that childfree women are their own advocates and defenders when disclosing their choices and make strategic choices to employ these roles.

244 11:30 am

Parent and Child Cultural Orientations and its Relationship to Treatment Goal Agreement

Raymond La, Psychology (M)

When children seek mental health treatment, parents are typically involved in initiating treatment. However, the parent and child may not agree on what problems to address in treatment. This may result in a situation known as the "therapist's dilemma": the therapist must choose between the parent or child's perspective in order to plan treatment and develop treatment goals. Culture is a potential source of information used to evaluate abnormal behavior. Therefore, culture may influence whether parents and children agree on treatment goals. The study will analyze the relationship between parent and child cultural orientations and the likelihood of parent-child treatment goal agreement.

The present study uses a mental health service-using sample of 270 youths aged 12-17 (40% female, 60% male) and their parents taken from a larger study. Cultural orientation is measured using the Pan-Acculturation Scale (American Cultural Orientation [ACO], Other Cultural Orientation [OCO]), and qualitative data on treatment goals were coded using a system that utilized the Child Behavior Checklist and Youth Self-Report for treatment goal categorization. Agreement was defined as parent and child co-endorsement of a treatment goal. We hypothesized a moderating effect in which parent-child dyads with similar cultural orientation scores will have a greater likelihood of treatment goal agreement relative to other dyads.

Logistic regression analyses found a significant interaction between parent and child OCO scores and a greater likelihood of parent-child agreement on treatment goals in total ($b = -.039$, $p = .074$, $OR = .962$) and externalizing problems-related goals ($b = -.006$, $p = .020$, $OR = .994$). The interaction mitigates the relationship between greater individual OCO scores and lower likelihood of treatment goal agreement in both findings. Other findings include: parent ACO score is associated with a greater likelihood of internalizing problems treatment goal agreement ($b = .113$, $p = .012$, $OR = 1.112$) and child OCO score is associated with a lower likelihood of internalizing problems treatment goal agreement ($b = -.092$, $p = .002$, $OR = .912$). Results provide some support for our hypotheses and highlight why therapists should consider parent-child cultural differences in explaining why the "therapist's dilemma" is occurring.

245 11:45 am

Does Childhood Maltreatment Affect Older Adult Cognitive Function? A Life Course Inquiry

Brooke Silveria, Social Work (M)

Recent research has found that late life cognitive decline is not inevitable but rather is influenced by various factors and conditions of earlier developmental periods. Childhood trauma has a negative impact on cognitive function in youth, and there is some evidence of these effects in middle-aged adults, but whether they extend into older adulthood is understudied. The present study, utilizing a life course perspective, aims to further clarify the relationship between early life abuse and neglect and cognitive ability in older adults. We conducted secondary analysis of the cross-sectional Midlife in the United States 2 (MIDUS 2) national survey and examined measures of childhood trauma and cognitive function. We found incidence of physical neglect to be associated with poorer outcomes in executive function. This finding further evidences the far-reaching consequences of childhood trauma and aids in justifying increased attention towards this public health concern. What's more, our results lend support for targeting seniors with earlier experiences of neglect for interventions to improve cognitive health, which may become an increasing necessity as the older adult population is expected to expand dramatically in the coming years.

246 12:00 pm

The Influence of Perceived Neighborhood Safety and Parental Influence on Adolescent Antisocial Behavior: A Longitudinal Study

Sarah Chavez, Research in Substance Use (D)

The persistence and pervasiveness of youth antisocial behavior (ASB) in the United States is a significant public concern (Vaughn et al., 2014). Youth ASB is associated with subsequent problems in adulthood such as committing later acts of crime (Border et al., 2018). Several risk factors that may lead to the development of youth ASB include neighborhood context and various parental influences. Research has shown that perceptions of neighborhood safety are positively associated with youth social-emotional development and overall health (Christian et al., 2015). Furthermore, low levels of parental influences such as engagement, communication, and familial cohesion are risk factors for the development of youth ASB (Hemphill et al., 2015). We will conduct a secondary data analysis to explore the extent to which perceived neighborhood safety and parental influences are associated with ASB. The current study will include a nationally representative adolescent sample, (n = 13,989), who were recruited to participate in the

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National Longitudinal Study of Adolescent to Adult Health (Add Health) in 1995. We hypothesize that high levels of perceived neighborhood safety and parental influences will be negatively related to ASB. Specifically, we hypothesize that there will be a significant negative relationship between perceived neighborhood safety and ASB. Furthermore, the relationship between parental influences and ASB will also be both significant and negative. We will analyze our data using multigroup structural equation modeling in MPLUS, version 8.0. If our hypotheses are met, our study will provide further support in the importance of implementing risk prevention and/or interventions that specifically attempt to improve neighborhood contexts and parenting characteristics as they may serve as youth protective factors against the development of ASB (Assari & Caldwell, 2017). These risk preventions and/or intervention strategies may be more influential to enact during the beginning of youth risk behavior trajectories.

247 12:15 pm

Gender Differences in Caregiver Engagement when Devices are Present During Meals at Restaurants

Heather Jaffe, Education (D)

Background.The current study explores the relationship between both parent and child media usage and parent-child interactions while dining at restaurants. Previous research points to an increase in child attention seeking behavior when caregivers are absorbed in their devices at a restaurant. Furthermore, the research shows the parental response to the child's behavior when they are absorbed in a device is harsher than previous responses to behaviors (Radesky et al., 2014). The aforementioned study focused solely on a hypothesis-generating qualitative analysis and did not take into consideration the gender of the caregiver. Radesky et al., also noted that the parent-child interactions were an area that warranted further exploration.

Objective.The current study seeks to address limitations of previous research by combining qualitative and quantitative analyses with a larger sample of parent-child dyads. This study will further explore the role of parental gender in parent-child interactions, in the context of media use.

Hypotheses.(1) While dining at restaurants males would be more engaged with their child than their female counterpart. (2) Males will be less engaged with their devices compared to their female counterparts.

Methods.Fifty parent-child dyads were observed in casual dining settings. Observers reached 80% reliability prior to beginning data collection. Subjects gender, group size, child seating type (i.e., car seat, high chair, booster, independent seating) and relative health of their meal was recorded using a pre-established code. Data was collected in 5-minute intervals for the duration of the dining experience. Data collected included rate of consumption by each individual, percentage of media use, qualitative assessment of the quality of parent-child interaction, and detailed narrative description of all behavior during the interval.

Results.Quantitative results are presented regarding the role of parent gender in media use and parent-child engagement. By using aqualitative approach, we highlight themes within the data regarding the role of digital media use by both the child and the parent. Additionally, the quality of parent-child interactions in the context of media use is discussed across 4 dimensions (e.g., warmth, engagement, hostility, disengagement).

Session B-9

Poster Engineering and Computer Sciences 3
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

248 10:45 am A

All Metal Heat Sink Dual Linear Polarized Phased Array Antenna for Ku-Band Applications

Rudraishwarya Banerjee, computational science (D)

In this abstract, a new 8×8 dual linear polarized phased array antennas, with 128 innovatively designed metallic radiators, each working as heat sink as well, is proposed for Ku band applications. Each single radiator is half wavelength in height, and fed by a stripline through a intuitively shaped balun. Two shaped radiators are placed at right angles within a metal cavity of square cross section and overall dimension of nearly $\lambda/2 \times \lambda/2$. This constitutes the unit dual linear polarized radiating cell. A multi-layered substrate is used to accommodate stripline feed for two radiators of an unit cell and surface waves generated due to thick substrate is supressed by using a number of vias, placed underneath each metal cavity, with a period of nearly $\lambda/6$ and diameter 12 mils. The single radiating element is designed to provide wideband performance with respect to S11 of 10dB between 12-15 GHz and acceptable radiation pattern is observed over the entire bandwidth. A 8×8 array will be designed with 64 radiating unit cells, each unit cell having two feed points. Spacing between unit cells depends on expected beam scan range of ±45 degree. Active S-parameter will be calculated for this array structure for the desired scan range over the matching bandwidth. Peak gain versus frequency will be evaluated as beam scans. The beamforming network will be directly integrated with the phased array antenna aperture. 3D metal printing technology will be employed to build the phased array antenna aperture. The full fabricated phased array antenna and the beamforming network will be tested for its impedance matching and radiation pattern in Antenna and Microwave lab at San Diego State University.

249 10:45 am B

3D Printed Magneto Electric Antenna for Sub - 6Ghz Band

Connor Laffey, Electrical engineering (U)

A single dual linear polarized 3D printed magneto electric antenna for the sub-6 GHz frequency band of the 5G spectrum

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is proposed. It can be considered for use in a 4x4 phased array antenna. A stable pattern, well matched impedance, and high isolation over the frequency band can be expected. The Conventional method of fabrication using metal stamping is challenging and expensive [B. Q. Wu and K. M. Luk, IEEE Antennas and Wireless Propagation Letters, vol. 8, 2009, pp. 60-63]. Since such complex structures can be easily and quickly fabricated using 3D printing, the use of 3D printed ABS plastic is being investigated. The antenna considered is a dual linear polarized magneto electric dipole that operates in the 4-6 GHz range. It is being modeled in Ansys HFSS with the properties of ABS plastic and covered with a finite conductive coating of silver ink. Simulated and measured results of the fabricated product will be included in the final report.

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250 10:45 am C

3D Printed Axial Corrugated Ka-band Feed Horn

Ila Agnihotri, Electrical Engineering (D)

This work presents the analysis and design of axial corrugated feed horn covering the full Ka-band of 26.5 GHz to 40 GHz (fractional bandwidth = 42.5%). The design is based on modal analysis of axial corrugations using Ansys HFSS full wave analysis tool. The objective is to achieve symmetrical beams with low cross-polarization and near constant edge taper. This feed horn would be used to illuminate reflector antenna in a mini-compact antenna test range at the Antenna and Microwave Lab (AML) at San Diego State University. The design is fabricated using 3D printing process and measured results are presented.

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251 10:45 am D

A Thermal-Noise Canceling Low Noise Amplifier using a Cascode Structure for 5G (n79) New Radio

Omar Flores, Electrical Engineering (M)

Fifth-Generation (5G) New Radio (NR) connectivity is set to launch shortly, in the year 2020. Superseding its predecessor, 5G NR seeks to address a major issue seen in mobile technology today, frequency congestion—due to the continuous increase in wireless traffic—by employing new technologies. n79 is a brand new frequency band set for mobile cellular usage; it is a time-division duplexed (TDD) band that spans from 4.4 GHz to 5 GHz (600 MHz), containing 3x the bandwidth of the largest pre-existing 4G band. Situated at the Radio Frequency Front-End (RFFE), channel noise plagues signal quality presented to the Low-Noise Amplifier (LNA). This research presents the analysis and design of a broadband LNA integrated circuit (IC), through simulation, fabrication, and measurement. Wishing to not augment anymore noise to the signal, this work employs an uncommon noise-cancellation technique in attempt to cancel a portion of its own noise, while bolstering the desired signal, prior to it traveling further down the radio chain. Meant for mobile cellular applications, the feasibility of this broadband architecture has been studied, and performance trade-offs have been formed. An understanding of performance has been established, and can be used, if this circuit topology is sought for 5G.

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252 10:45 am E

A Comparative Study of Waveguide based Polarizers at 5G Millimeter Wave Bands

Philip Nguyen, Electrical Engineering (U)

A comparative study on different mechanisms for generating circular polarization in circular waveguide (CWG) is performed using Ansys HFSS. Circular polarization is achieved by introducing discontinuity within the CWG structure. A simple compact metallic ridge polarizer without steps is introduced and compared with mono grooved and dielectric septum polarizer designs. Performance comparisons based on electrical length, amplitude division, orthogonal phase stability, and axial ratio (AR) are presented. All presented designs operate in the Ka-band which covers the 27.5-33 GHz including 27.5-28.35GHz 5G band. Analysis of compact structures at this frequency are important for satellite communications and 5G applications where circular polarization is critical in doubling channel capacity and against the presence of fading. The design takes into account the tolerance requirements of 3D metal printing at millimeter wavelength. Figure of merits are design complexity and compactness without compromising the electrical performance.

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253 10:45 am F

Robust low noise sensitivity of PIV-based pressure measurement by omnidirectional integration

Jose Moreto, Engineering Science (D)

We derived an analytical expression for the error propagation from the PIV-based pressure gradient to the integrated pressure by the omnidirectional integration method. The pressure calculation for the boundary points is an iterative process and the error decreases for each iteration. The inner domain pressure is a one-step calculation which uses the boundary point solution. For the inner domain, the error is an average of the boundary error and the integration truncation error. The analysis shows that the omnidirectional integration provides an effective mechanism to reduce the sensitivity to random noise. We verified those results using a direct numerical simulation (DNS) database of isotropic turbulence flow, with a homogeneously distributed random noise added to the entire field of DNS pressure gradient. The random noise has a magnitude varying randomly within the range of 40% of the maximum DNS pressure gradient. A total of 1000 statistically independent noise distributions achieved by using different random number seeds. Three different methods are compared. The average error normalized by the standard deviation of the DNS pressure is 0.8+-0.4 for the Poisson approach, 0.154+-0.015 for the Circular Virtual Boundary method and 0.149+-0.015 for the Rotating Parallel Ray method, indicating the validity of the expressions derived.

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Session B-10

Poster Engineering and Computer Sciences 4
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

254 10:45 am G

Low-Power Bluetooth Motion Sensor for Spinal Kinematics

Austin Wolf, Electrical Engineering (M)

Low back pain is one of the most common causes of daily limitations in leisure and work-related activities. Still, in many cases no specific injury mechanism or etiology can be identified. Continuous long-term monitoring of spinal kinematics could provide clinicals the power to better understand back pain but also provide users real-time recommendations to encourage better behavior throughout the day. A system was designed to collect orientation data from orientation data of the spine and send data back to a mobile application. The device uses a low-power motion sensor that collects gyro, accelerometer and magnometer data, and fuses the data into a quaternion orientation vector that can be sent to a mobile device via Bluetooth Low Energy. This work focused on producing a device that could operate at low-power during sampling and provide accurate data with minimal drift. The power consumption and accuracy of the sensor were tested, demonstrating reliable accuracy and a 28 hour battery life during continuous monitoring.

255 10:45 am I

Developing a Vision-based Intersection Safety Monitoring System for Vulnerable Road Users

Shenchao Zhang, Computer Science (M)

Statistics shows that demand for walking and bicycling is increasing in the United States. Statistics also shows an upward trend in pedestrian and bicyclists crashes. Pedestrian fatalities in California increased 5.9 percent from 819 in 2015 to 867 in 2016, bicyclist fatalities increased 8.1 percent from 136 in 2015 to 147 in 2016. In addition, forty-one percent of pedestrians-vehicle crashes occurred at roadway intersections, and an additional 8 percent occurred in driveways or alley intersections. Thus, it is critical to improve safety for these eco-friendly modes of travel. The goal of this research is to develop a vision-based system to evaluate risk score for intersections where many interactions of pedestrian and bicyclists with motorized traffic exist. This research focuses on conflicts of vehicle-pedestrian and vehicle-bicycle at signalized intersections. Computer vision detection (Faster-RCNN) and tracking (KCF) methods were applied to extract the trajectory data from video data collected at several intersections in the City of San Diego. Machine learning based 3D reconstruction method was employed to improve the accuracy of trajectory data. The results from the proposed system will be used in safety surrogate analysis to proactively evaluate safety at intersections.

256 10:45 am J

What Safety Surrogate Measures Can be Utilized to Proactively Evaluate Pedestrian and Bicyclist Safety at Signalized Intersections?

Anagha Katthe, Civil, Construction and Environmental Engineering (M)

According to NHTSA, estimated number of pedestrians killed in 2016 is 5,984 and bicyclists killed in 2016 is 840. Traditionally historical road crash data are used as indicators to evaluate the level of road safety. Crash data is often used to identify required safety improvements and asses the present conditions. However, this traditional approach requires a long period of time since roadway crashes are rare events. Even a long period of time may not produce enough data especially if a specific crash type is being studied (e.g., a crash between bicyclists making right turns from an approach and through traffic on the opposite approach). In addition, changes may occur in long periods of time such as design improvements, demand increase/decrease, etc. that potentially could impact the results of safety evaluations.

Traffic conflict techniques can be adopted to assess safety for road-users and the use of these traffic conflicts for safety diagnosis has been suggested as a substitute for the analysis of historical crash data. A traffic conflict is a perceptible situation where two or more road-users proceed towards each other in time and space so far that there is risk of collision provided their movements remain unchanged. The severity and frequency of conflicts can be estimated using measures known as Surrogate Safety measures (SSM). The goal of this research is to investigate several SSMs and identify the ones that are suitable to evaluate pedestrian and bicyclists safety at signalized intersections. Various SSMs can be utilized according to the suitability of the situations depending on whether it is a rear-end, side swipe or right-angle cross collision and many more. In this research, the traffic conflicts are automatically detected through computer vision. Preliminary data exploration showed that SSMs such as Time to Collision (TTC), Post encroachment time (PET), and Deceleration rate to avoid crash (DRAC) are appropriate measures for analyzing vulnerable road user safety. Further, it was found that proper selection of SSM with respect to conflict type is critical since some SSMs cannot be calculated for certain conflict types. Results from this research can be applied in methodologies to more accurately determine potential crash situations involving pedestrian and bicyclists.

257 10:45 am K

Where are High-Risk Intersections for Walking and Bicycling in the City of San Diego?

Mahdie Hasani, Civil Engineering/ Transportation Engineering (M)

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The overall percentage of pedestrian and bicycle crashes now accounts for 18% of total fatalities, up from 13% only a decade ago. This upward trend needs attention from researchers and local agencies. In addition, bicycle and pedestrian volumes, known as exposure data, is an essential part of safety assessments. However, most existing bicycle and pedestrian networks are not equipped to routinely collect count data, such as is typically collected for vehicular networks. Given this lack of bicycle and pedestrian data, local agencies are not able to accurately assess which facilities are in the highest need for improvement. This study utilized multiple data sources, including automated pedestrian and bicycle counters, video cameras, crash databases, and other data sources, to inform pedestrian and bicycle safety improvements. The goal of this study is to combine and use the strength of data sources to produce useful insights into transportation safety planning. Specifically, the study identified high-risk intersections for walking and bicycling in the City of San Diego.

This study was conducted in four major steps: (1) Identifying the intersections for short-term video data collection. A multi-stage random approach was adopted to benefit from both cluster analysis and stratification sampling. (2) Developing a vision-based intersection monitoring system to automatically count pedestrians and bicyclists. (3) Converting short-term counts to yearly counts. As continuous counts for a whole year at many sites may not be available, a common practice is to collect short-term count data for a sample of locations and then apply an extrapolation method. To perform extrapolation, each short-term counter must be matched to one or more long-term counters with similar demand patterns. This study developed a matching approach based on a cluster analysis method, Partitioning Around Medoids, and a supervised learning approach, K-Nearest Neighbor. (4) Developing exposure models and a risk equation. A risk equation was developed based on several factors that are associated with the pedestrians' and bicyclists' risk crossing signalized intersections. Our approach can also be used for motorized traffic and for identifying high-risk locations at other analysis units such as roadway segments as well as census tracts or traffic analysis zones.

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258 10:45 am L

Flow Visualization of Patient-Specific Right Heart Models in a Mock Circulatory Loop

Jacob Steiner, Bioengineering (M)

Diseases which affect the right heart are commonly attributed to the presence of pulmonary artery hypertension (PAH). While about half of PAH cases are associated with other causes such as heart failure (HF), the other half are idiopathic. Due in part to its delayed and difficult diagnosis, PAH causes 6.5/100k deaths in the US annually. The earlier the disease can be identified, the higher the chance of survival. Therefore, this project aims to create a patient-specific model for blood flow visualization through the right heart to observe abnormalities which could suggest the presence of cardiovascular disease.

Contrast-enhanced CT images were taken from patients at UCSD undergoing pre-surgical planning for right ventricular assist device (RVAD) placement. The images were segmented by compartment before the right ventricle (RV), right atrium (RA), and pulmonary artery (PA) were reattached and exported as an STL file for 3D printing. Once printed, a thin silicone model can be fabricated using a dip-molding process. The artificial silicone heart model is then inserted into a mock circulatory system along with bio-prosthetic valves in the tricuspid and mitral valve sites. By pumping a solution with properties similar to those of blood through the loop, the hemodynamics can be observed. Pressure inside the RV is measured with a catheter-tip pressure transducer (Millar, AD instruments) and monitored continuously alongside RA and PA pressures, RA inflow, and RV outflow. Particle image velocimetry (PIV) is used to visualize the blood flow through the system. Previously, PIV was only possible in 2D, however using a novel imaging system, 3D hemodynamic patterns can be observed and analyzed.

A pilot study achieved a mean RV pressure of 4.5mmHg, mean PA pressure of 12.3mmHg, and mean PA flow rate of 2.81L/min. The 2D PIV results, however, were inconclusive due to the 3-D nature of the flow field. A new system for interpolating a series of 2-D measurements has been designed and will be used in additional experiments. The results will expand on the relationship between hemodynamics and cardiac flow in the context of PAH.

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259 10:45 am M

A wearable respiration monitor based on the giant magneto-resistive effect

Shane Witsell, Electrical Engineering (U)

Continuous health monitoring of vital health systems via a wearable device, has become a key aspect of research as of late. This research will focus on the measurement of the respiratory system as it pertains to a key function of life. Current methods of monitoring can be excessively bulky or difficult to wear when in movement. These devices are also targeted for different purposes depending on what activity they are intended to measure alongside of. Some examples of these actives include measuring exercise, seated tasks, or sleep. The latter study being knows as polysomnography. Much of the work in this field pertaining to the study of obstructed sleep apnea. The current wearable methods generally focus on a band or strap that is placed across the bottom of the sternum. Though these devices are functional in their current state, these methods of wearable technology all include limitation. These limitations concerning that the central device must be in one singular piece. The maximum expansion of the chest is limited by the size of the devices. The devices are also under constant stress, thus the accuracy of the sensor will slowly degrade over time. We then propose to shift to a method that does not require a direct contact between sensor and object. Such a method can be achieved through a giant magneto-resistive sensor (GRM). This would allow the GMR sensor and a small magnet to be placed on the chest in a secure fashion for measurements of all activity in a reliable fashion similarly to smaller scale systems used for respiration

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monitoring. This design has been implemented and tested on a range of measuring methodology.

Session B-11

Poster Physical and Mathematical Sciences 6
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

260 10:45 am N

Characterization of PHMB as a dynamic capillary coating for fused silica capillaries

Jessica Torres, Chemistry (M)

Capillary zone electrophoresis (CZE) has become a widely used and effective tool for the analysis of proteins, peptides, and ions. This process is typically used for biochemical analyses for the detection of proteins. Many CZE separation methods utilize bare fused-silica capillaries, however using bare silica capillaries can cause a great challenge for a protein analysis. Reproducibility due to protein absorption to the capillary inner surface leads to peak tailing and loss of efficiency. Modification to the capillary surface is the most common and effective way of controlling the electroosmotic flow (EOF) and prevention of sample adsorption to the inner capillary surface. In addition, the use of these capillary coatings improve resolution and the speed of an analysis.

One form of capillary coatings used in CZE separations is the use of polycations, such as poly(allylamine) hydrochloride. Our work explores the utility of another polycation for capillary coatings, polyhexamethylene biguanide (PHMB) that is commonly used as a disinfectant. This cationic compound is to be used as a capillary coating by removing the natural anionic charge of a bare silica capillary and providing control of EOF. With the use of PHMB as a capillary coating, there is full reversal of EOF and effective separations of biologically important proteins.

This poster will present our investigation of the effectiveness of PHMB as a cationic capillary coating. The durability of this coating is examined through a series of tests at a range of pH values and concentrations; upon this determination the run to run reproducibility for proteins is determined. By using PHMB as a capillary coating, we have shown that this coating has minimized sample absorption to the capillary walls improving resolution and reproducibility.

261 10:45 am O

Improving the Response of Solar Cells to Infrared Light by Attaching Silver Nanoparticles

Debra Harris, Chemistry (U)

The project focuses on attaching silver nanoparticles to the surface of silicon solar cells using organic chain-structured molecules. Silicon does not have a high absorption intensity as it nears 1100 nm within the infrared light region. However, silver nanoparticles are capable of absorbing infrared light more intensely than silicon and can be altered in shape and size to primarily absorb infrared light. This project aims to improve the efficiency of silicon solar cells, through the combination of silicon and silver nanoparticle light absorption, up to the 30% range.

The project method includes a new and much faster process of producing silver nanoparticles, which was developed by fellow research group member and PhD student Nobuyuki Yamamoto. The silver nanoparticles are then bonded to one end of an organic chain-structured molecule, while the other end of the chain is bonded to the surface of a silicon solar cell. By connecting silver nanoparticles to the solar cell surface through the use of an organic chain molecule, complications that have arisen for other researchers, when putting silver nanoparticles directly on top of or within the solar cell surface, are prevented.

The outcome of the project is to compare the efficiency difference between silicon solar cells and silver nanoparticle linked solar cells. Research into the project so far has focused on the production of silver nanoparticles using the newly discovered process. Glass surfaces without adsorbed chemicals form silver nanoparticles of intended size and shape. Yet this approach has shown to be significantly impeded by other glass surface environments. Glass surfaces that contain certain adsorbed chemicals interfere with the reaction process and produce silver nanoparticles of unintended size and shape.

262 10:45 am P

Dual Protection Layer Strategy to Increase Photoelectrode-Catalyst Interfacial Stability: A Case Study on Black Silicon Photoelectrodes

Michael Fairchild, chemistry (U)

Photoelectrode degradation under harsh solution conditions continues to be a major hurdle for the long-term operation and practical, large-scale implementation of solar fuel conversion. In this study, a dual-layer TiO2 protection strategy is designed to improve the interfacial durability between nanoporous black silicon and photo-catalysts (i.e. platinum and/or amorphous molybdenum sulfide). In this study, nanoporous silicon photocathodes implemented with catalysts are passivated with an intermediate TiO2 layer, followed by an additional TiO2 layer on top of the catalyst. The gas phase atomic layer deposition (ALD) of TiO2 ensured a uniform and complete coverage of both the nanoporous silicon substrate and the catalyst. After 24 hours of electrolysis at pH = 0.3, unprotected photocathodes layered with platinum and molybdenum sulfide retain only 30% and 20% of their photocurrent, respectively. At the same pH, photocathodes layered with TiO2 experience an increase in photocurrent retention: 85% for platinum-coated photocathodes and 91% for molybdenum-sulfide-coated photocathodes. Under alkaline conditions, unprotected photocathodes experience a 95% loss in photocurrent within the first four hours of electrolysis. In contrast, TiO2 -protected photocathodes maintain 70% of their photocurrent during 12 hours of electrolysis. This approach is quite general and can be

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applied to the protection strategy to offer benefits to a variety of photoabsorbing-catalyst interfaces under both acidic and basic pH in various electrolyte conditions.

263 10:45 am Q

Fine-Controlling Morphology of Nanostructured Silicon Interfaces Using Magnetic Nanoparticles for Photoelectrochemical Water Splitting

Margaret Patrick, Chemistry (M)

Reducing cost and increasing the functional lifetime of photoabsorbing materials used in photoelectrochemical (PEC) water splitting remains a major challenge in solar energy conversion. Nanostructured silicon (Si) is a promising candidate with great potential to address these challenges, however its performance is sensitive to its interface nanostructure. The goal of this project is to achieve refined shape control during etching of silicon interfaces using magnetic metal nanoparticles. Further, we could correlate the catalytic performance towards PEC with its refined interface morphology. Current methods for producing black silicon require coating wafers in silver ions then etching in a hydrofluoric acid and hydrogen peroxide bath, resulting in straight nanoporous channels which oxidize easily, losing its activity. Preliminary scanning electron microscopy (SEM) results from samples produced by a modified metal-assisted chemical etching method using Fe3O4@Ag core-shell nanoparticles in the presence of a magnet suggest modification of the subsurface channel morphology into novel, ultra-high surface area serpentine forms is possible, potentially improving photoelectrode's performance and lifetime. Cross-sectional SEM images show samples produced with or without a magnet present, respectively, have different channel patterns. Samples produced without the magnet showed relatively straight channels, while samples in a magnetic field showed teardrop shapes on the cross-section, suggesting the tunnels curved and exited the side of the material. Optimizing the shape of the channels is key to maximizing catalytic activity. This material could be used in many renewable energy systems, including in our previously reported bioanode-photocathode hydrogen generation cell to enhance photoelectrochemical hydrogen evolution and reduce cost.

264 10:45 am R

Catalytic Regeneration of NADH from NAD+ for Enzymatic Consumption!

Nicholas Williams, Chemistry (D)

Enzymes are nature's perfect instruments for driving chemical reactions, yet harnessing their power for industrial applications remains a challenge. Many of these enzymes require cofactors like nicotinamide adenine dinucleotide phosphate in the reduced form (NADH) or the oxidized form (NAD+). Both forms of the cofactor are expensive, inhibiting their further applications for cost-effective industrial processes. This study investigates the potential of catalytically reducing NAD+ into NADH for enzymatic consumption for the production of small organic molecules. This goal was tackled with developing novel electrocatalysts and photocatalysts. The former utilizes cheaper materials while the latter has the ability to use sunlight to reduce the energy demand for driving the catalytic process. Titanium and platinum supported on carbon fiber paper were used as electrocatalysts, while platinum and molybdenum(II) sulfide supported on nanoporous silicon photocathode were employed to harness light as a photoelectrochemical conversion system. H1 and C13 Nuclear magnetic resonance spectroscopy (NMR), UV-Vis spectroscopy, and electrochemical methods are used to monitor product and byproduct production. Currently, these systems are being optimized for biocompatibility to regenerate NADH for the enzymatic production of formaldehyde.

265 10:45 am S

Organic Solvent Induced Modification of Black Silicon Structures

Waltteri Vakki, Chemistry (U)

A lack of readily available clean energy is a critical issue being faced in the current day and age, and our project seeks to provide a solution to this dilemma by using “black silicon” to collect solar energy. Black silicon is a nanoporous silicon material that has been widely used in photoelectrochemical hydrogen and oxygen evolution, for energy purposes. It works by the process of “light trapping” in which the matrix absorbs more solar radiation than it reflects. B-Si though is plagued by poor stability and long-term performance issues, limiting its functionality. Through use of the conventional “Metal assisted” etching method and organic solvents we have been able to produce a radically more stable form of B-Si. We have named it “Swiss- Cheese” due to the unconventional, non-linear columns found in the silicon matrix. This presentation focuses on the study of organic solvents and their effect to the formation of the B-Si substrate. This discovery of solvent effects advancement warrants further study, distinctly in the controlled modification of the nanopore shape and size and in the coupling of various catalysts to the black silicon matrix.

Session B-12

Poster Physical and Mathematical Sciences 7
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

266 10:45 am T

Kinase Inhibition Using Atropisomerism

Ramsey Hazin, Chemistry - Biochemistry - BS (U)

Kinases are enzymes that catalyze the addition of phosphate groups from high-energy ATP molecules to other molecules, causing proteins in the cell to become either active or inactive. Kinases are important because they control most biochemical

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pathways and if mutated they can lead to serious diseases such as cancer. Therefore, many medicinal chemists focus on designing kinase inhibitors that mimic ATP to inhibit mutated kinases and hopefully treat diseases caused by malfunctioning kinases. However, due to many kinases having very similar active sites, many inhibitors have off-target inhibition which can lead to numerous side effects.

Due to modern drug design, small molecule inhibitors contain many sp2-sp2 bonds, leading to instances of atropisomerism. Atropisomerism is a form of chirality that arises from hindered rotation about a bi-aryl bond. Kinase inhibitors bind to kinases in an atroposelective fashion with one enantiomer being the active conformer and the other enantiomer possibly binding off-target and leading to poor selectivity and potentially undesirable side effects.

In the Gustafson Lab we focus on using atropisomerism as a tool to design selective kinase inhibitors. The Gustafson Lab has successfully designed a kinase inhibitor that is selective to the RET kinase but in order to see the scope of this strategy, we will apply it to other kinase inhibitors and work to improve their potency and selectivity against other kinases such as BTK, mTOR, and Src. We are currently in the process of synthesizing the scaffolds for these other kinase inhibitors. These kinase inhibitors can also be used to create bifunctional molecules called PROTACs which involve the recruitment of an E3 ligase, a protein that marks other proteins for degradation by the proteasome. These specialized molecules can be used not only to inhibit the function of problematic proteins, but fully degrade said proteins.

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267 10:45 am U

Enantioselective Synthesis of Pyridines and Quinolines Atropisomers via Nucleophilic Aromatic Substitution

Andrea Sanchez, Chemistry (U)

Atropisomerism, or axial chirality, can be found in drug discovery, typically small-molecule drugs. Many biologically relevant atropisomers exist as rapidly racemizing compounds because majority of atropisomers are stereochemically unstable. Although these compounds are not considered chiral, they bind to their target in an atropisomeric conformation with the non-relevant atropisomer contributing little to the desired activity. We could decouple this promiscuous activity however by rigidifying the atropisomeric axis and then isolating each atropisomer. One draw-back in medicinal chemistry is obtaining a large-scale quantity of the desired compound. To address this, we are developing an 'organocatalytic' nucleophilic aromatic substitution (SNAr) for relevant bioactive N-heterocycles, pyridines and quinolines, that are analogous to FDA approved small-molecule drugs. We have tested our current substrates with our current nucleophilic conditions and our preliminary data shows promising results. We are currently optimizing our nucleophilic conditions so we can then enantiomerically enrich our array of synthesized pyridines and quinolines. Our hope is to provide these studies as a foundation for N-heterocycles and other atroposelective methodology towards pharmaceutically relevant atropisomeric scaffolds.

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268 10:45 am V

Mechanistic Studies of Lewis Base Catalyst-Controlled Regioselective Chlorination of Arenes and Heterocycles

Lalena Janke, Chemistry (U)

Aryl chlorides are numerous in drug discovery as synthetic handles and initial steps for functionalization. Electrophilic aromatic substitution (EAS) is a common method of synthesizing such aryl chlorides. However, this method of synthesis of C-H functionalization is hindered by harsh reaction conditions, reduced reactivity towards electron poor substrates and an inability to control the regioselectivity of the products. Regioselectivity is still an unsolved problem to the innate electronic properties of various substrates. Regioselectivity of the electrophilic halogenation is controlled primarily by the substrates, commonly resulting in a mixture of constitutional isomers. It would be synthetically useful, especially in the field of medicinal chemistry, to have access to a mild catalytic-controlled halogenation methodology.

In our lab, we have recently developed a Lewis base catalyst-controlled regiodivergent method for the regioselectivity of simple phenols. Triphenylphosphine sulfide was our most reactive catalyst and 2,2′-bis(diphenylphosphino)-1,1′-binaphthyl (BINAP)-disulfide both gave para-selectivity. While investigating the mechanism of action, we observed the formation of catalytic intermediates such as a triphenylphosphine dimer. We hypothesize that these intermediates could possess catalytic activity to primarily drive product formation. To investigate the true catalytic species, we performed kinetic experiments via nuclear magnetic resonance (NMR) spectroscopy to measure the initial rate of reaction across a variety of substrates comparing all four proposed catalytic species. Across all substrates, the triphenylphosphine monomer catalyst was, on average, 3-4 times faster than the dimer, with the fastest being 15 times faster, indicating that the dimer, as previously hypothesized, is not the primary catalytic species and its formation during the reaction is likely a factor in slowing down the rate. As such, we suspect that being able to prevent the dimer formation would yield even faster rates of reaction, and we hypothesize that the sterics of the catalyst may impact the intermediate formation.

To gain more insight into the structure and electronic properties of the catalytic intermediates, future studies include the isolation of crystal structures and utilization of computational calculations and models such as Gaussian.

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269 10:45 am W

Peptide Stapling by Lewis Base-Bronsted Acid Catalyzed Sulfenylation of Tryptophan

Zachary Brown, Chemistry (D)

Peptide stapling is the process of linking two sites of a

peptide together in the effort to create and maintain its three-dimensional shape. The function of peptides and proteins relies solely on the integrity of the three-dimensional shape; therefore, increasing the durability of the shape of a peptide or protein directly increases it's effectiveness in a biological setting. Stapling a peptide will increase its resistance to environmental perturbations, including changes in temperature, pH, and solvent composition. Current strategies to staple peptides require the use of expensive artificial amino acids or extreme reaction conditions. We take a different approach by focusing on mild conditions and a natural amino acid, tryptophan. We have developed a Lewis Base-Bronsted Acid catalyzed sulfenylation of tryptophan in the practice of stapling peptides. We synthesized sulfur containing polyethylene glycol derivatives, which we have successfully used as a link between tryptophans on a peptide. Successful peptide stapling is analyzed by Matrix Assisted Laser Desorption Ionization (MALDI) and circular dichroism. Our peptide stapling strategy has potential to greatly increase the use of peptides as medicinal therapeutics. This project has been generously funded by NSF.

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270 10:45 am X

Structural Optimization of Ret Pyrrolopyrimidine Kinase Inhibitors

Valeria Garcia, Biochemistry (U)

There are over 500 kinase proteins in the human genome, and their aberrant activity can lead to life-threating diseases. Consequently, a dense amount of medicinal research has been focused on the development of small molecule kinase inhibitors. More than 80% of the FDA approved kinase inhibitors contain rapid interconverting chirality, also known as atropisomerism, and although they are considered to be achiral, they interact with their targeted proteins in an enantioselective fashion.

In research done previously in the Gustafson lab, exploiting atropisomerism was used as a selectivity filter and to increase the selectivity of pyrrolopyrimidine (PPY) Ret kinase inhibitors. In their report, they rigidified a bi-aryl axis by adding bulky substituents ortho to the chiral axis and observed that the (Ra)-atropisomer was 2-fold more selective towards Ret over Src. One drawback of this research was by rigidifying the chiral axis resulted in the loss of potency compared to the parent racemizing inhibitor (1857nM vs 128nM IC50 towards Ret).

To further demonstrate that this strategy of exploiting atropisomerism as a selectivity filiter we must optimize the inhibitors for both selectivity and potency. To do this, we utilized a molecular docking software called MOE to create a list of potential analogues that were calculated to be both selective and potent for Ret over Src. We then synthesized the molecules (15 scaffolds, 28 atropisomers) and separated the (Ra)- and (Sa)-atropisomers through chiral phase high liquid performance chromatography (HPLC). These isolable, stable atropisomers were then subjected to kinase inhibition assays to test the inhibition of the molecules. Structure activity relationships (SAR) showed a larger 'gate keeper' aryl ring and an electron neutral methyl group off the PPY increased potency towards Ret (17nM IC50) and selectivity (>100-fold Ret/Src and >500-fold Ret/Vegfr2). The lead inhibitor displated cytotoxicity (IC50 2.5uM) in estrogen-deprived breast cancer cells (ED-MCF7) and showed elimination of Ret phosphorylation via western blots. Both the in silico and in vitro data suggest that we can obtain a higher potency while maintaining the selectivity in novel atropisomeric inhibitors.

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271 10:45 am Y

Oxidative Photo-Catalyzed Sulfenylation of Substituted Indoles and Benzothiamides

Ashley Nguyen, Chemistry (M)

A variety of sulfur containing scaffolds widely exists in both natural products and pharmaceuticals. There are many synthetic routes that have been developed to synthesize aryl sulfides from aryl halides, commonly using various sulfenylating reagents like N-thiosuccinimide. These methods result in a milder yet efficient conversion of simple substituted arenes to aryl sulfides, however sulfenylation via photoredox catalysis is not as widely explored. The use of photoredox allows for the generation of a more reactive radical intermediate that can be employed to generate a C-X bond, or C-S in this case.

A general Ruthenium (II) catalyzed intermolecular sulfenylation of substituted indoles, such as melatonin, by photoredox catalysis has been developed using Na2S2O8 as the oxidant. The addition of a Lewis base (pyridine) affords better yields of the sulfenlyated product by increasing the nucleophilicity of sulfur. This method also extends to intermolecular C-H thiolation of substituted aromatic thioamides to form a variety of benzothiazoles.

Session B-13

Poster Behavior and Social Sciences 8
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

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272 10:45 am Z

School-based Grief Groups can Improve Child Grief Symptoms

Hannah Zimmerman, Child Development (M)

Background. Approximately, 5 percent or 1.5 million United States children lose one or both parents by the age of 15. School-aged children experiencing grief, do not have an outlet to provide guidance on how to deal with grief, or an understanding of grief. Schools are a particularly accessible treatment location since children can attend without the need for transportation or scheduling. However, there is currently no evidence-based curriculum that exists for school-based treatment groups. Children who experience bereavement, at young ages, are unable to describe their feelings and unable to demonstrate coping mechanisms for their grief. Previous data

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collected in the school-based grief groups in San Diego County indicates that, 67% did not know what grief was, 69% did not know anyone with similar loss, 77% reported feeling lonely and depressed, 84% reported a negative change in their school performance, 87% could not identify coping skills, 87% did not know what common grief reactions were.

Methods. Pre- and Post-assessments were gathered from school-based grief groups offered by Elizabeth Hospice in San Diego County. Each year this program serves 15 to 17 schools (5 elementary schools (K-5), and 10-12 Middle and High School resulting in 130 students experiencing a range of expected, unexpected, and violent death loss. The 10-week school-based grief group covers 5 modules: (1) Grief Psycho-education (2) Coping Skills (3) Isolation & Loneliness (4) Processing Grief (5) Planning for the Future

Hypothesis. School-based grief group would produce significant improvement in participants report of desire to keep up with friends or make new ones.

Results. 92% reported feeling less lonely and depressed after group, 97% could identify common grief reactions, 98% said group was helpful, 98% could identify coping skills, 100% could identify a support system, 100% felt it was easier to talk about their grief after the program. Additional results will be discussed addressing findings from pre-/post- assessment of change in desire to keep up with friends or make new ones.

Conclusion. School-based grief groups can produce significant improvement in grief symptoms, increase knowledge of coping skills, and how to identify coping skills.

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273 10:45 am AA

Parenting, Play, and the Negotiation of Identities

Jezyle Deo Diez, Communication (U)

Parent-Child relationships are universal, and communication can facilitate or constrain the development of healthy family relationships. Parent-child communication involves a continuous negotiation of identities for both the parent and the child. This negotiation of identities is a cyclical process as parents and children change their communication with one another, so too do their identities change. However, research has not explored the continuous negotiation of identities that parents and children engage in, as parents try to guide children in learning appropriate and healthy behaviors. This ethnographic study explores how play may be designed to foster healthy relationships between parents and children, and how in the process each negotiates their identities. Two themes emerged that offer interpretations for participant observations, interviews, and autoethnographic writings. The first theme reveals this idea of being the best parent and the second reveals this idea of how parents might be engaging or resisting self-judgement in a playground setting. Directions for future research could be adapted to include more diverse families. Challenging heteronormative nuclear family structures, and inviting more inclusive exploration can progress more representative data. Further investigative measures could also determine if marital status has any effect or influences on the negotiation of identities through play interactions.

274 10:45 am BB

Examining the Link between Maternal Victimization and Child Behavior Problems: Through the Lens of Developmental Cascade Model

Jacqueline Duong, Psychology (M)

Past studies indicate a distal association between maternal history of victimization and childhood behavior problems, though there is limited knowledge about the pathways linking the two. A history of child maltreatment has been associated with a range of negative mental health outcomes in adulthood, including depression, substance use problems, and personality disorders (Green et al., 2010). Furthermore, maternal mental health has been identified as a salient predictor of children's behavior problems and socioemotional development (Thompson, 2007). Researchers have noted that maternal depressive symptoms during infancy are linked to increased risk for compromised mother-child interactions, such as harsh and over-reactive discipline (Callendar et al., 2012) and physical and psychological aggression (Conron et al., 2009), which mediate the association between maternal depressive symptoms and externalizing behavior problems during middle childhood (Villodas et al., 2015). Identifying the developmental pathways from maternal victimization to positive and negative child developmental outcomes is crucial to understanding the long-term and intergenerational consequences of child maltreatment. This study extends prior research by prospectively examining the mediational pathways from maternal victimization to child behavior problems through maternal depressive symptoms and mother-child interactions. Data from 738 mother-child dyads were drawn from the Longitudinal Studies in Child Abuse and Neglect, a consortium of studies from five geographic regions in the U.S. Children were identified as having a history of maltreatment and/or being at risk for maltreatment prior to the age of 4 years. Maternal history of childhood physical and sexual maltreatment, as well as adult victimization was assessed using the Caregiver's History of Loss and Victimization questionnaire (Hunger & Everson, 1991) when the children were 4 years old, maternal depressive symptoms were assessed using Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) when the children were 4 and 6 years old, maternal use of physical discipline was assessed using the Conflict Tactics Scale (Straus, 1979 & 1996) when children were 6 and 8 years old, and mother-reported child behavior problems were assessed using the Child Behavior Checklist (CBCL; Achenbach, 1991) when children were 8 and 10 years old. Structural equation modeling was used to examine serial mediation paths over time.

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275 10:45 am CC

Quality of Engagement in Spanish- and English-Speaking Parent-Child Dyads During Free Play

Anele Villanueva, Child and Family Development (U)

The quantity and quality of parent language input varies

across cultures. Based on transcript analyses, Masters, et al. (2018) found that dual language Spanish-speaking parent-child dyads used less rich communicative engagement than monolingual English-speaking peers and level of engagement predicted child vocabulary. Of interest is the role of communicative gesture in accounting for this disparity in parent-child engagement. Specifically, analyzing speech alone may attenuate estimates of parent-child engagement in dual language families.

In a sample of 49 Spanish-dominant parent-child dyads there was no significant effect of parent-reported input, relative exposure to Spanish and English, nor any other demographic predictor of parent-child engagement. There was a significant effect of Language such that English-speaking parents evinced richer engagement than their Spanish-speaking counterparts ($t(48) = 3.84$, $p = .004$). However, two engagement styles, Symbol Infused (SI: joint engagement using symbols that describe an object, process, or function) and Fluent and Connected (FC: smooth turn-taking meaningfully connected within and across speakers), were associated with vocabulary size ($r(46)=.552$, $p<.001$ $r(46)=.502$, $p<.001$, respectively) in both samples. In a subset of Spanish-speaking children ($n=11$) we tested whether estimates of parent-child engagement may be attenuated by failing to take into account communicative gesture. Preliminary data provide only weak support for this hypothesis. Before incorporating gesture, the mean score for SI was 5.36 (SD=2.73). After incorporating gesture the mean score was 6.18 (SD=1.77). For FC, the scores before and after incorporating gesture were 1.91 (SD=1.58) and 2.18 (SD=1.72), respectively. This suggests that observed differences in the quality of communicative engagement between English monolingual and Spanish-dominant families cannot be explained by taking gesture into account. In preparation for the SDSU Student Research Symposium, we will contrast the hypothesis that the observed difference in communicative engagement observed between English monolingual and Spanish-dominant samples reflects real differences in communicative style with the hypothesis that this difference is an artifact of differences in the use of communicative gesture. We will complete gesture coding for 15 English and 15 Spanish-dominant dyads to clarify the role of gesture in supporting parent-child engagement.

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276 10:45 am DD

The Effects of Genetic Condition and Ease of Conception on the Perceived Likelihood of Hiring a Health Care Advocate for a Child

Julia Stal, Psychology (U)

Health care advocates (HCAs) are specialists in meeting the needs of patients by minimizing the intricacies associated with navigating the health care system. An HCA's duties may include: coordinating treatments, ensuring patient rights, scheduling appointments, and/or assisting with illness management. Although some researchers have examined various physical and demographic factors, researchers have not considered the effects of difficulty conceiving a child or the effects of a genetic condition on the perceived likelihood of hiring an HCA for a child. Therefore, the purpose of the present study was to examine the effects of a genetic condition (cystic fibrosis or leukemia), or length of time to conceive a child (2 months or 5 years), on the perceived likelihood of hiring an HCA for a child. The participants included 139 males (45.6%) and 165 females (54.1%), with an age range of 18 to 84 years, ($M = 40.42$, $SD = 17.12$), who were randomly selected from the visitors at Balboa Park, a large cultural park in San Diego, California. Participants were randomly assigned to read one of four vignettes in which an individual was described as the parent of a child who had been diagnosed with either cystic fibrosis (genetic) or leukemia (non-genetic) and for which the parents tried to conceive for either 2 months or 5 years. Participants were asked to provide demographic information and to imagine they were the parent described in the vignette. Participants completed a self-report questionnaire in which they indicated their perceived likelihood of hiring an HCA to assist with their child's care. A 2 (Genetic Condition) by 2 (Length of Time for Conception) between-subjects analysis of variance was performed on participants' perceived likelihood of hiring an HCA for their child. The preliminary results indicate that there was no main effect for length to conception ($p = .761$) or genetic condition ($p = .699$), and that there was no significant interaction between time to conception and genetic condition ($p = .292$). These findings suggest that genetic or non-genetic conditions and easy or difficult conception does not affect participants' perceived likelihood of hiring an HCA for a child.

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277 10:45 am EE

Grammaticality in English-Spanish Preschool-Aged Children

Alicia Escobedo, Language and Communicative Disorders - JDP (D)

Background

Of the challenges facing speech-language pathologists, a lack of appropriate assessment tools needed for linguistically diverse child populations remains as a concern (Oetting, 2018). Language sample analysis has been proposed as an appropriate tool for assessing bilingual children that yields useful measures such as mean length utterance in words (MLUw), number of different words (NDW), and percent grammatical utterances (PGU; Rojas & Iglesias, 2009). In particular, PGU has shown to be a useful predictor of a child's grammatical ability (Bedore, Peña, Gilliam and Ho, 2010). Despite this, development of grammatical ability is not well understood in preschool aged bilinguals with typical and atypical language development. Understanding these developmental patterns aids in clinical decision making for children of linguistically diverse backgrounds.

The present study aims to characterize the language abilities of Spanish-English bilingual preschool-aged children using language sample measures, including MLUw, NDW and PGU.

Methods

Data is currently available for 8 typically developing (TD) Spanish-English bilingual preschoolers and 2 peers with language impairment (LI; mean age, respectively = 54.25,

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48.50 months; SD = 4.30, .70; average Spanish exposure = 70%, SD = 40.41). Language impairment was identified using parent report and performance on the Bilingual English Spanish Assessment (BESA; Peña, Gutierrez-Clellen, Iglesias, Goldstein & Bedore, 2018). Language samples were transcribed and coded by trained research assistants, and then analyzed for the measures of interest.

Preliminary Results

Results show that TD participants had an average PGU of 52.36 (SD=24.25) in English (Spanish mean = 42.81, SD= 31.04), MLUw (mean =3.16, SD=.65) and NDW (mean=121.75, SD=52.24) at the beginning of the year. The LI participants yielded a PGU of 23.57 (SD=40.40), MLUw (mean= 1.33, SD=.28) and NDW (mean= 24.50, SD= 21.92)

Implications

The results of the current study suggest that measures of grammaticality in combination with established measures like MLUw and NDW can serve as possible tools to screen for language impairment in bilingual children. In addition, percent current use will be analyzed to further understand the role of proficiency in assessments of language ability. Ultimately, these findings aid in clinical settings where expected trajectories for bilingual language development are needed.

Session B-14

Poster Behavior and Social Sciences 9

Friday, March 1, 2019, 10:45 am

Location: Montezuma Hall

278 10:45 am FF

Examining the nature of spelling errors in deaf and hearing readers using an English spelling production task

Andrea Manriquez, Psychology (U)

In hearing readers, orthographic representations can be influenced by phonological representations that develop as a result of spoken language experience. Profoundly deaf readers have impoverished access to spoken language phonology. Nevertheless, deaf readers develop orthographic representations that might be guided by different underlying spelling processes compared to hearing readers. By examining their spelling errors, we can determine the extent to which orthographic representations are dependent on structures that result from experience with spoken language.

The goal of the study was to compare the nature of spelling errors by hearing English speakers and congenitally deaf ASL signers. Based on previous research by Hanson et al. (1983) and Olson and Caramazza (2001), we hypothesized that both groups would conform to the principles of English orthography, however, the hearing readers' errors would reflect more phonetically acceptable renderings of the target word segments compared to the deaf readers who would make more phonetically illegal errors.

In an English spelling production test, participants were asked to spell 30 words using a cloze procedure, in which a written sentence context was provided for the target word and the first letter of the target word was presented. The target words were drawn from previous studies on spelling errors (Hanson et al., 1983; Olson & Caramazza, 2001).

Seventy-five deaf ASL signers and 113 hearing speakers completed the spelling test. Spelling errors were categorized into six different types: substitution, omission, insertion, letter shifts, and transposition adjacent and non-adjacent. The overall spelling accuracy was 77% for deaf signers and 84% for hearing non-signers. Deaf participants produced 610 spelling errors and hearing participants produced 607 errors. Figure 1 shows that hearing participants made significantly more substitution errors than deaf participants and this result replicated Hanson et al. (1983). In contrast, deaf participants made significantly more letter shifts, adjacent and non-adjacent transposition errors which resulted in a greater number of non-phonetic misspellings compared to hearing non-signers whose errors tended to be more phonetically legal. Although deaf readers showed differential sensitivities to orthographic structures, they were by no means inferior in their spelling accuracy to hearing readers.

279 10:45 am GG

Word Processing Efficiency among deaf and hearing readers

Priscilla Martinez, Psychology (U)

Differences between deaf and hearing readers have become increasingly apparent over the years. It is important to study these differences because there are lower literacy rates in the deaf population. Deaf readers have reduced access to phonology and enhanced visual attention in the periphery, which are both important for word processing. The Word Processing Efficiency hypothesis proposed by Belanger and Rayner (2015) suggests that these differences allow deaf readers to have better visual processing of word forms in a single fixation than hearing readers. The current study sought to replicate these findings and analyze additional eye movement patterns. We collected data on regressions, refixations, skipped words, and other standard eye tracking measures. We used an EyeLink 1000 eyetracker to record eye movements from adult deaf and hearing readers while they read sentences in English and answered comprehension questions. Results showed that deaf readers made fewer regressions and had significantly shorter second pass fixation durations. Although deaf readers had lower comprehension scores and reading levels, data collection is ongoing and groups will ultimately be matched on reading ability and nonverbal intelligence. Analyses of other eye movement measures will also be conducted. Thus far, this study has found that deaf readers are more efficient at visual word processing than hearing readers (despite lower reading levels), which supports the Word Processing Efficiency hypothesis. Research in this area can enhance teaching methods for deaf readers by identifying reading patterns that characterize skilled reading in this population.

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

280 10:45 am HH

Bilingual Language Processing: An ERP Study of Cognate Status

Yazmin Medina Alcantar, Psychology (U)

Bilinguals have the ability during a conversation in one language to manage activation of words in the other language. To investigate the underlying mechanisms of between language activation, we previously used a production task in which Spanish/English bilinguals had to translate displayed words into the other language (see “perro” say “dog”, see “table” say “mesa”). Words included cognates, non-cognates and false-cognates (false-cognates share form but differ in meaning). We did not observe the typically larger N400 for non-cognate or false-cognate items, but for false-cognates, consistent with the increased demands required to suppress the production of the form-overlapping incorrect translation, we found a greater late negativity (~800 ms). The present study explores differences between that task and a language-comprehension task using the same items. We predicted that the demands of comprehension (i.e. greater competition in lexical-semantic processing for non-cognates and false-cognates) would emerge on the N400. In the same participant population in San Diego, we used a go/no-go semantic comprehension task (press to animal names in either language). When summing across languages, consistent with prior research, our Spanish/English bilinguals showed a subtle yet predicted pattern of differences between the three types of items in the N400 epoch; false-cognates showed the largest N400, followed by non-cognates and then cognates. Interestingly, unlike prior results for cognates, L1 (Spanish) items showed the largest effects. Comparable effects in English (L2) were much smaller. This pattern, reversed in predictions for L1 and L2 cognate effects, may reflect a change of dominance for reading in these bilinguals.

281 10:45 am II

Politeness markers on meanings: Rational Speech Act approach to Korean honorifics

Hagyeong Shin, Linguistics (M)

Honorifics in Korean have been traditionally considered as politeness markers, which explicitly express respect and deference (Sohn, 1999). Therefore, it could be easily assumed that honorifics would align with speakers’ goal to be more polite (Brown and Levinson, 1987). However, in-depth discussions on Korean honorifics suggest that honorifics can mean more than the absolute respect or deference (Brown, 2015; 2013; Eun and Strauss, 2004; Koo, 1995; Strauss and Eun, 2005). This study investigates pragmatic effects of honorifics, and suggests that honorifics, when used in a context where they are not expected, can change the semantic content of the verb phrases.

To test this hypothesis, an experiment was designed and conducted, informed by the Rational Speech Act (RSA, Frank and Goodman, 2012; Goodman and Stuhlmuller, 2013) framework. Models based on RSA have successfully explained how utterances could be understood with non-literal meanings by accessing the recursive reasoning process between pragmatic speakers and pragmatic listeners (Kao et al., 2014; Kao and Goodman, 2015; Yoon et al., 2016). The experiment for this study measured participants' posterior beliefs of the meanings of the 2 verb phrases (“did very well”, “did very poorly”) when they are associated with 8 different honorific forms (honorific suffix: existing, not existing × speech level forms: deferential, polite, intimate, plain) in 4 different relationship settings (friend-friend, upperclass-underclass colleagues, underclass-upperclass colleagues, professor-student).

The experimental results showed that normative and non-normative honorific forms, defined by relationship contexts and norms in language uses, can bring different interpretations of the verb phrases “did very well” and “did very poorly”. To be specific, when a friend or an upper-class colleague uses overly-polite honorific forms, their positive utterance with the literal meaning of “did very well” could mean a negative feedback. Overall, the results suggested that pragmatic listeners interpret utterances much holistically, based on the interaction between semantic content, honorifics, and normativity of the honorifics, within the relationship context of the conversation. In conclusion, this study challenges the perspective on honorifics as mere reflections of social context, and suggests that honorifics can bring context-dependent meanings, in other words conversational implicatures.

282 10:45 am JJ

Investigating the use of a syllable discrimination task to study word retrieval in stroke-induced aphasia

Veronica Kneram, Speech, Language, and Hearing Sciences (U)

The purpose of this research is to study word retrieval in picture naming compared to a syllable discrimination task. To target word retrieval, we used the blocked cyclic picture naming paradigm. In this paradigm, pictures are presented within semantically homogeneous or heterogeneous blocks. Reaction times are typically larger in homogeneous versus heterogeneous blocks, an effect referred to as the semantic interference effect. The semantic interference effect is thought to reflect word retrieval difficulty, and this task has therefore been used to study word retrieval in patients with aphasia versus controls. However, a major drawback of this task is the fact it requires overt speech, and speech production processes are often affected in aphasia, independently of word retrieval processes. Therefore, we wanted to test whether a syllable discrimination task could be used to bypass overt speech, but nevertheless allow to study word retrieval. This research focused on control subjects, but will later focus on patients with stroke induced aphasia. For the syllable task, subjects were instructed to press buttons according to the number of syllables in the picture name. For the naming task, the subject was instructed to say the word they saw on the screen aloud. We analyzed reaction times and error rates in both

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tasks to determine which was more difficult, and to determine whether there was an interference effect in both tasks. Our preliminary results show that the syllable task is more difficult, as higher error rates were observed compared to the naming task. There was a significant semantic interference effect overall on reaction times, but also a significant interaction between semantic context and task. The size of the semantic interference effect was smaller in the syllable task than in the naming task. In addition, the semantic interference effect was highly variable on an inter-individual basis in the syllable task. This suggests that the syllable task may not be an ideal task to elicit word retrieval in a similar way as picture naming, although future investigations are needed to confirm this pattern of results.

283 10:45 am KK

Tracking the time-course of visual word recognition using different types of word-like stimuli: An ERP study

Polina Krom, Psychology (U)

The ability to rapidly recognize visually perceived words is fundamental to skilled reading. Using event-related potentials (ERPs), the present study sought to investigate the time-course of the neuro-cognitive processes involved in visual word recognition. Prior work has shown that the lateral distribution of the N170, an earlier ERP component that peaks around 170 ms after stimulus onset, is differentially sensitive to linguistic (words) and nonlinguistic (symbol strings) stimuli. While later ERP components, such as the N250 and N400 that peak around 250 ms and 400 ms after stimulus onset, are sensitive to sub-lexical and lexico-semantic processes, respectively. We contrasted ERPs to minimally different categories of word-like visual stimuli in a group of monolingual English speakers engaged in a go/no-go repetition detection task. ERPs were time-locked to five types of visual stimuli including words (e.g., “table”), pseudohomophones (non-words that sound the same as existing words - e.g., “brane”), pseudowords (words that look and sound like they have an existing lexical meaning in a language but they actually do not - e.g., “wruck”), random consonant strings (e.g., tblnr), and strings of symbols (e.g., $%&*^). The early N170 was larger over the left hemisphere compared to the right hemisphere for all stimuli composed of letters, while symbol strings generated a more bilateral response. There was no difference in the laterality of the early N170 among any of the letter-based categories although slightly later (after 200 ms) these stimulus categories started to differ. More specifically, between 200 and 300 ms there were differences between consonant strings and the three orthotactically legal stimuli (which did not differ from one another). In addition, all three orthotactically legal categories produced greater negativities than either consonant strings or symbol strings starting around 400 ms (i.e., the N400). These results will be discussed in the context of recent models of word recognition and orthographic tuning.

Session B-15

Poster Education 3

Friday, March 1, 2019, 10:45 am

Location: Montezuma Hall

284 10:45 am LL

Does language shape how students understand the equal sign?

Kevin Pelaez, Mathematics and Science Education (D)

In this study, we explored the relationship between language, thought, and the understanding of the equal sign. One of the most used symbols in mathematics is the equal sign. The equal sign is a symbol that describes exact mathematical equivalence. Research has shown that students with a sophisticated understanding of the equal sign perform highly on algebra problems. The equal sign also has non-mathematical meanings, whether it be used to describe civil rights equality or to suggest that an artificial sweetener taste the same as sugar.

In Spanish, “igual” can be used to describe exact sameness (equal) or approximate sameness (similar). This subtle difference in meaning may suggest Spanish speakers may have a different resource base for understanding the mathematical concept of equality. However, there is little to no research that documents how bilingual students in high school understand the equal sign. To understand this, we compared the understanding of the equal sign of five fluent English to five Spanish dominant high schoolers in English monolingual classrooms. This was guided by their definitions of the equal sign and strategies used to solve equivalence problems.

285 10:45 am MM

Cheat Sheets as a Tool to Support the Individualization of ASD Services in Group Settings: A Pilot Study

Brittney Ventenilla, Special Education with an emphasis in Autism (M)

The heterogeneity of Autism Spectrum Disorder (ASD) makes the individualization of interventions an essential component of treatment, but one barrier to doing so is that providers may lack the training, time, or resources. Cheat sheets are a low-cost method to make child specific information more readily accessible, have been recommended for use in classrooms for child-specific Individualized Education Plan information. However, the effectiveness of cheat sheets as an individual component has not yet been studied in group clinic settings. To test the effectiveness of cheat sheets on the individualization of targeted skills in group Social Skills Training (SST), this study used a multiple-baseline design across participating children. Across phases, we collected and analyzed data on therapist initiations of target skills, child progress on target skills, and therapist confidence. During

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the intervention phase, therapists had access to a cheat sheet containing child-specific information. Overall, there were no significant differences in therapist and child behavior between conditions. However, the trends observed in therapist confidence and therapist initiations of target skill opportunities for one child participant suggest that cheat sheets may be able to bring an individualization component to a naturalistic setting, an important determinant of generalization. The potential value and the cost-benefit ratio of implementation suggests that the effectiveness of cheat sheets should be measured in a larger, higher powered follow-up study.

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286 10:45 am NN

Getting Ready for School: Language Performance in Young Bilinguals

Julia Moluf, Speech, Language and Hearing Sciences (U)

Background:

Bilingual children demonstrate unique language development patterns and are often misdiagnosed as language impaired (Grosjean, 1989; Stubble Kester & Peña, 2002). Thus, a more complex process is needed to assess the language abilities of children from culturally and linguistically diverse backgrounds. Unfortunately, there are minimal diagnostic tools available that are intended for children who are exposed to two languages (Stubble Kester & Peña, 2002).

Measures of language abilities are often correlated with measures of kindergarten readiness. To better understand the role of language in kindergarten readiness, it is important to consider the relationship across a variety of language measures.

Currently, we ask what language measures correlate with kindergarten readiness in bilingual children from low socioeconomic backgrounds.

Methods:

Participants included 33 preschool-age Spanish-English bilingual children from a local elementary school. Participants' demographic information was gathered via a take-home questionnaire filled out by a parent or guardian. Participants, on average, were 4 years 1 months old (SD = 5.88 months). There were 19 male participants and 14 female participants. Children heard Spanish at home more than 30% of the time (M = 79.39, SD = 23.18). Maternal education was reported with a mean of 11.25 years (SD = 2.66; high school graduation = 12).

Data was collected at the preschool site through the administration of standardized assessments as well as play-based and narrative language samples. Measures included standardized measure of kindergarten readiness (letter, color, shape identification; narrative and writing skills), standardized and nonstandardized measures of English vocabulary and grammar, and standardized measures of Spanish vocabulary and grammar.

Results:

Performance on the kindergarten readiness was positively correlated with standard and nonstandard measures of English vocabulary and grammar. Performance on the same measure was negatively correlated with the percentage of Spanish heard at home.

Conclusions:

Bilingual children's English language skills were found to be related to a measure of kindergarten readiness. Of note, the Lollipop Test: A Diagnostic Screening Test of School Readiness, is administered in English. Next steps should determine patterns when children who hear more Spanish at home are administered a kindergarten readiness measure in Spanish.

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287 10:45 am OO

Comparing the Roles of Leadership and School Staff in the Implementation of EBPs for ASD in Schools

Kate Hart, Psychology (U)

Background

Evidence-based practices (EBPs) for students with autism spectrum disorder (ASD) are being implemented in schools today. However, various factors can affect how EBPs are implemented, including leadership support. A lack of leadership support can be detrimental since a major component for successful school programing is effective leadership (Lempesis, 2009).The relationship between high-level administrators (such as directors of special education) and school staff (such as teachers) effect how successfully EBPs are implemented into schools.

Objective

To investigate if high-level administrators are seen as allies or obstacles by school staff and how those relationships have an effect on the implementations of EBPs. To identify common themes that emerge between influences on implementation of EBPs and the staff surrounding them in these schools when it comes to trying to implement EBPs.

Methods

To identify school and district factors related to the implementation of EBPs, six focus groups were conducted. Participants included 30 school and district staff members (93% female). Transcripts were independently coded and NVivo software was used to identify major themes. Participants also completed the Implementation Climate Scale (ICS) and the Implementation Leadership Scale (ILS).

Results

Preliminary analysis indicates differences in factors related to implementation of EBPs across high-level administrators and school staff. High-level administrators (including Director of Special Education and Principals) are more frequently discussed in relation to approval support and expectations. School staff are more frequently discussed in relation to attitudes and buy-in. These results indicate high level administrators and school staff have essential roles in the implementation of EBPs but in varying capacities. Further analysis will be conducted to compare the major themes from the focus groups with ratings on the ILS and ICS.

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288 10:45 am PP

Barriers to Cervical Cancer Screening in the Somali Community

Saadia Ali, Psychology (U)

Background/Purpose:

In Somalia, cervical cancer is the second most common cancer and the second leading cause of death. The burden of cervical cancer can be reduced by early detection via screening. Somali immigrant women have low screening rates. This literature review identified barriers to cervical cancer screening among Somali immigrant women.

Methods:

This review searched PsycINFO, CINAHL, ERIC, and MEDLINE databases. Keywords used with variations of Boolean connectors were cervical cancer, Somali, Somali women, and screening. References pages of relevant articles were reviewed for additional studies. To meet inclusion criteria, the article had at least two keywords, and the full text of the article was available.

Results/Findings

Barriers identified in this literature review were: 1) lack of knowledge, 2) language, 3) low perceived risk, 4) embarrassment and fear associated with female circumcision, and 5) cultural and religious beliefs. Somali women were ill-informed about cervical cancer screening. There were limited Somali interpreters who sufficiently translated medical terms at hospitals and clinics. Somali women perceived a low risk of sexually transmitted diseases and associated this with a low risk of cervical cancer. They felt uncomfortable revealing their circumcision and feared pap smears were painful. Somali women did not seek medical care unless sick and had fatalistic beliefs regarding cancer.

Discussion:

The Somali community remains unaware of the consequences of cervical cancer and the benefits of early detection through screening. Somali women face institutional, cognitive, emotional, and socio/cultural barriers to cervical cancer screening. Culturally-tailored interventions, involving Somali community leaders from the conception, may improve adherence to screening.

289 10:45 am QQ

One Teacher, Many Voices: The Impact of a Dialogic Stance for Pedagogical Practice with Emergent Bilingual 5th Grade Students

Al Schleicher, Education (D)

This study seeks to gauge the effectiveness of a dialogic stance to teaching in a 5th grade bilingual classroom. Current research demonstrates teachers must go beyond tools and methods, and create a dialogic stance to their pedagogical practice in order to increase student engagement and learning potential. Lev Vygotsky's sociocultural theory of learning and Robin Alexander's theory of dialogic pedagogy are together employed as a theoretical framework to explain bilingual students' attitudes toward learning in a dialogic learning space. Unique to this area of inquiry is the study of dialogic pedagogy and cognitive transfer of students from Spanish language arts to mathematics. This inquiry-driven classroom environment for studying Spanish literature in the students' heritage language, and then transitioning to English to study mathematics is a novel area of research. In terms of instructional practice, the researcher further examined the classroom teacher's impetus for taking a dialogic stance in order to co-validate students' lines of thinking. Results indicate that when teachers purposefully nurture and sustain such a stance, students access to collaboratively solve mathematics and acquire language bolsters achievement growth in the classroom.

Session B-16

Poster Interdisciplinary 5

Friday, March 1, 2019, 10:45 am

Location: Montezuma Hall

290 10:45 am RR

Assessing the suitability of human-modified forest as habitat for the Endangered moor macaque monkey (Macaca maura) in Sulawesi, Indonesia

Nancy Guzman, Anthropology (U)

Human activities, such as agricultural expansion and infrastructural development, are increasingly impacting the survival of endangered wildlife. The moor macaque (Macaca maura) is an endangered primate that lives in South Sulawesi, Indonesia. However, our knowledge of the ecology, behavior, and habitat of this species is primarily limited to studies conducted in protected forests. Our goal is to begin to fill this gap in knowledge by assessing whether human-modified environments provide suitable habitat for this primate. To that end, we compared forest structure and composition and the abundance of food species between a human modified forest, "the Education Forest" (EF) and a protected forest, "Karaenta" (KR), by establishing vegetation plots (10 x 20 m) in each forest (EF: n = 33, KR: n = 34). The following information was collected from each plot: botanical and local name, and diameter-at-breast-height (DBH) of all trees ≥ 5cm. In Karaenta, 803 individual trees were enumerated, 81% of which were macaque food trees, compared to 655 individual trees in the EF, 90% of which were food species. The density of food trees is similar in the two forests (EF: 0.9 trees/m2, KR: 0.095 trees/ m2). In the human-modified forest (EF), mean DBH of food species, a measure of forest productivity, is significantly higher (15.3 cm ± .77 SEM) compared to the protected forest (12.6 cm ± .45 SEM) ($Z = -2.493$, $p = .013$), but the diversity of food species is significantly lower ($H' = 1.46$) compared to the protected forest ($H' = 1.68$) ($t = 10.04$, $df = 482$, $p < .001$). Our findings indicate that the human-modified forest is comparable to protected forest in terms of the abundance, density, and potential productivity of macaque food trees. These results suggest that human-modified environments may provide suitable habitat for

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moor macaques, and therefore, should not be ignored when planning conservation initiatives. Such efforts might include reforestation efforts to increase food species diversity for moor macaques in anthropogenic environments.

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291 10:45 am SS

Talking and Listening Healing Circles

Aurora Valdez, Critical Studies of Theater Television and FIlm (U)

The dignity of racialized and gendered bodies, sexualities, and families of Latinas/xs is often not honored in dominant society or interculturally. Latina/x experiences and needs related to reproductive justice, reproductive oppression, and health in general across their diversity are often missing, misrepresented, or not documented in their own words within scholarship and the media. “Voces: Latin(x) stories in Reproductive Justice” presents preliminary research that was initiated through our Women’s Studies community engagement and social responsibility course that bridges academia, the local Latinx South Bay region of San Diego, and a reproductive justice framework. Through practicing what Laura Rendón calls a “sentipensante (sensing and thinking)” pedagogical approach, the course emphasized cultivating communication skills to become honest storytellers and careful listeners in an effort toward being well rounded scholars and activists, accountable to the communities we work with. We will discuss “CuranderaScholarActivist” praxis, oral and digital storytelling healing methodologies, and an intersectional feminist lens to better understand society and ourselves (Dr. Irene Lara’s GENS480 Syllabus). Our community engaged research collaboration includes California Latinas for Reproductive Justice (CLRJ’s) “Speaking Story” project, which addresses the need for Latina/xs to tell their own stories of struggle and dignity on their own terms and with support. We will present on two groups that we had the opportunity to tailor for our research based on the broader umbrella of reproductive justice: young parenting and navigators of eating disorders. Through these passion projects, we conducted two listening and talking circles of five to six Latinxs each. In addition to the circles, we documented individual testimonies for the California Latinas for Reproductive Justice digital archive website, a clearinghouse of stories potentially used to politically advocate for Latinx’s reproductive justice needs. This was a community-based effort that entailed engaging community members, including friends, family, and fellow students, close to our homes, but also taking the time to learn by example from other organizations currently working in the South Bay. We will conclude by assessing how this ongoing collaborative research project has benefited CLRJ, participants, and ourselves.

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292 10:45 am TT

Brightside Produce Store Characteristics and Owner Perceptions

Mariangella Castrejon, Psychology with an emphasis in Industrial Organizational Psychology (U)

Food insecurity affects approximately 504,829 people (343,972 adults, 160,857 children) in San Diego County. A number of studies have found associations between food insecurity and adverse health outcomes in children and adults, including poorer diet, reduced intake of fresh produce, and higher risk for obesity. The overarching goal of the BrightSide Produce Program (BrightSide) is to increase the accessibility, availability, and affordability of fresh produce in underserved communities in San Diego while strengthening and expanding the local food system. BrightSide is able to address the needs of the community by delivering fresh fruits and vegetables to small food stores in underserved communities. Currently, BrightSide delivers produce to thirteen stores in National City. As part of its program evaluation efforts, BrightSide is executing a longitudinal, multi-method evaluation plan in stores that partner with BrightSide that includes store audits (baseline and over time) and manager/owner interviews. This study analyzes the store audits and baseline manager interviews to develop an understanding of store characteristics and store owner perceptions of their role in the community.

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293 10:45 am UU

SDSU West Proposal

Tai Disla, Urbran Studies (U)

Problem statement

On November 6th, 2018, a San Diego Citywide ballot initiative approved SDSU’s plan’s to create an SDSU West campus on the former Qualcomm Stadium site. Given SDSU’s interest in collaborative design processes for this new site, key questions we sought to address were as follows:

How should SDSU West be designed, and various scenarios tested to meet future goals of sustainability, livability, and equity?

How might we be able to do this collaboratively, incorporating input from a diverse members of campus and community stakeholders?

This poster presentation illustrates how a collaborative geo-design process can be conducted to guide the future design of the SDSU West Campus.

Methods

As members of Dr. Appleyard’s Research Team, we collaborated with Professor Jankowski’s Geography Class with help from Chiara Cocco to use a cloud-based software, Geodesignhub as the collaborative design platform and the geo-survey tool, Geoforage, to collect individual design proposals and ideas in a pre-workshop phases. We also used the Smart Growth Equity Calculator to explore key sustainability, livability & equity relationships of the area. Two evaluation maps were developed to evaluate the suitability index respectively for re-development of eight territorial systems (e.g. Housing Low Density, Commerce and Industry) and for Blue and Green infrastructures.

To develop and test various scenarios, we were divided into six groups and worked both independently in our teams, and then collaboratively. While staying within the eight relevant territorial systems deemed as guidelines for building use importance, we

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compared the scenarios.

Results

Each group was asked to select different combinations of proposals to create a design alternative as the result of an early negotiation among the team members and in line with their development goals and interests. In creating the alternatives, students had a choice to consider whether or not technological innovations or a high population growth rate would occur in their specific development scenario.

Conclusion

Overall, it was decided that University use, mixed use, and transportation were the most important for SDSU West to key sustainability, livability, & equity objectives.

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294 10:45 am VV

Review and qualitative analysis of trans and gender nonconforming experiences within eating disorders treatment

Ethan Lopez, Lesbian Gay Bisexual Transgender and Queer Studies (U)

Eating disorders affect all people regardless of gender, race, class, ethnicity, and ability. However, emerging literature has shown that trans individuals are at an elevated risk for developing eating disorders (Testa, 2017). Moreso, nonbinary people have been overlooked or excluded from research in general (Gordon, 2018).

One possible source of health disparities is lack of access to trans-affirming eating disorders treatment. For example, there may be a lack of education and knowledge about trans populations and affirming care within the ED field; and accessible treatment may be limited, particularly in treatment centers, hospitals, and mental health clinics. The purpose of this study was to examine literature on transgender populations and the interactions within the eating disorders field and to also review public posts and listed topics on a trans advocacy site for eating disorders. The goal is to inform directions for research and developing evidence based treatment and prevention.

The literature review focused on qualitative case studies, from which 21 were reviewed. The bulletin board analysis looked at data from 01/04/18 - 01/22/19. For topics of discussion, we only looked at topics listed, not content, due to privacy.

The studies we reviewed were mostly focused on binary transgender women and men and did not mention non-binary patients; no studies focused on evidence based treatment for trans folx within eating disorders treatment. Analysis of bulletin board posts indicates a potential lack of transgender competency. Posts describe instances in which providers are not being trained to respect pronouns, use preferred names, microaggressions and misgendering by staff, and treatment centers exclude trans patients. The relevant topics from the review were problems with staff, other patients, accessibility, cost, surgery, hormones, trauma, and bullying.

What we conclude from the lit review and testimonials is there is a need for more professional cultural and transgender competency trainings within the field, more representation of trans folx in research, and further modifications of treatment programs and centers that allow access to treatment. Future work should inform the development of responsive practice and treatment guidelines for trans gender nonconforming populations to help make services more accessible.

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295 10:45 am WW

Relational Identity and the Bonding of Consciousness

Brian Archibald, Philosophy (M)

The current and historical models of consciousness offered by science and philosophy have failed to satisfactorily explain how it is even possible that we have unified conscious experience at all.

David Chalmers calls for a new Hegelian synthesis to address critical combination problems remaining within promising forms of panqualityism and Russellian monism, in hopes of moving these positions further towards a solution. But unless we can proffer a compelling ontological and phenomenological model that describes the natural interaction between our unified subjectivity and the expressed phenomenal qualities of the contents of our conscious experiences, we will remain forever halted at the precipice of this critical explanatory gap.

To answer this challenge, the metaphysical model of consciousness called Relational Qualityism (RQ) offers to become Chalmers' enjoined synthesis to directly address the "hard problem" of consciousness. In pursuit of this goal, RQ proposes that haecceitisitically subjective identity is the foundation of any and all consciousness. As such, it constitutes an existentially fundamental subjective point of perspective that each and every existential entity possesses necessarily. This fundamental "I-ness" is present in every existent as protoconscious potential that is actualized through a natural process of relational combination to form unified conscious subjects that can participate in any given conscious experience.

In response to the pivotal combination problems of consciousness, RQ proposes that just as the intrinsic masses of the quantum constituents of physical matter are shared in relational bonds in the composition of that matter, so too are the haecceitistically subjective identities of each of those same quantum constituents relationally bound as a single, unified identity with an existentially unique point of perspective. That bonded relational identity constitutes the dynamically stable, unified conscious subject that enjoys phenomenal experience of the categorically identical relational qualities of the contents of experience, as well as explains the phenomenal unity of those contents themselves.

This project will explore, expound, and defend the requirements and entailments of haecceitistic subjectivity, explain the fundamental mechanism by which unity of relational identity and phenomenal content is achieved, and seek to describe how unified relational identity participates in conscious experience of unified phenomena.

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296 10:45 am XX

Examining Labor Policies for Women Farmworkers in Chile

Juliana Huaroc, Latin American Studies/Public Administration (M)

The purpose of this mixed methods study is to examine fair labor standards for female agricultural workers in seasonal positions in Chile. As with California, Chile's agricultural labor is contingent and seasonal, leaving both workers and farmers vulnerable to a consistent workforce. There are a large number of women and in particular, temporeras suffering precarious working conditions characterized by a lack of legal protections because they are subcontracted or outsourced, despite Chile being one of the world's top exporters of fruit. According to Chile's National Women's Service (SERNAM), half of the seasonal workforce are women and approximately 70% of temporeras work without a contract during peak season for fruit. Many large farms provide housing for their workers, though the condition of said housing is variable. Despite substandard housing conditions, working in the seasonal workforce is desirable to women because of the opportunities to earn a substantial amount of money. The expansion of female employment in the fruit-export industry offers temporeras access to income, often earning more than men during the peak season. The precarious nature of seasonal work calls on the representation of the temporeras in public policy to break down barriers for women in the workplace.

Session B-17

Poster Health and Nutrition & Clinical Sciences 4
Friday, March 1, 2019, 10:45 am
Location: Montezuma Hall

297 10:45 am YY

Functional Movement Performance in Future Healthcare Professionals. Do students possess what they promote?

Ryan Breneman, Kinesiology - Physical Therapy (U)

BACKGROUND/PURPOSE: Musculoskeletal injuries (MSKI) are the leading category of occupational injury among healthcare workers. Additionally, healthcare workers in settings focused on exercise performance often need to demonstrate exercises for patient education. The Functional Movement Screen (FMS™) is recommended as a tool for MSKI risk management and assessment. A sequence of seven tests are performed to assess balance, core stability, flexibility and mobility. A cumulative score of less than or equal to 14 has been associated with an increased likelihood of MSKI in numerous populations, including professional athletes and military populations. The purpose of this study was to evaluate the movement proficiency of students enrolled in exercise based health care professions by using the FMS™.

METHODS: A prospective cross-sectional design was utilized. SDSU students enrolled in the Athletic Training (AT), Doctor of Physical Therapy (DPT), or Masters of Exercise Science (ENS) in exercise physiology or applied movement science programs were eligible to participate. All participants completed the Health Related Physical Activity Questionnaire (HRPAQ). Administration of the FMS™ was conducted in accordance with published guidelines. All tests were supervised and scored by two examiners.

RESULTS: 65 students (18 AT, 43 DPT, 4 ENS) participated in the study. 57% (n=37) of participants had an FMS™ score (>14) considered to be low risk for MSKI. Performance by 39% (n=9) AT, 41% (n=18) DPT, and 25% ENS (n=1) students were in the high-risk category for MSKI. There was no significant difference in FMS™ composite score between men (15.2 +/- 1.7) and women (14.5 +/- 1.5) ($p = 0.082$). HRPAQ indicated higher physical activity in males (10.1 +/- 1.6) than females (8.7 +/- 2.5) ($p = 0.007$). Self-reported health related physical activity demonstrated a low correlation with FMS™ composite score ($r_s = 0.247$).

CONCLUSIONS: Forty-three percent of healthy young adults, on course to become a future healthcare professional, performed poorly on the FMS™. Healthcare providers with poor movement proficiency may be at greater risk for incurring an employment related MSKI and also encounter challenges when instructing patients in movement patterns for which they do not possess requisite skill.

298 10:45 am ZZ

Posterior Chain Muscle Performance during Isolated Knee Flexion using Isokinetic Dynamometry Versus the Nordbord Nordic Hamstring Exercise

Joseph Cuellar, Kinesiology: Applied Movement Science (M)

PURPOSE: Injuries to the hamstring (HS) muscles are common in athletes. Ensuring full recovery of HS strength following injury is important to reduce the risk of reinjury and promote a safe return to sport (RTS). Isokinetic dynamometry (ID) is the "gold standard" for assessment of HS muscle performance however, widespread access to ID is limited. Hamstring muscle performance during the Nordic Hamstring Exercise (NHE) with the NordBord (NB) may provide a comparable means of assessment with greater accessibility. The purpose of this study was to compare posterior chain muscle performance during isolated knee flexion with ID versus the NB NHE.
METHODS: Forty-nine healthy adults (25 women) participated in the study. Participants completed a familiarization session followed by the formal testing session at which the order of ID and NB NHE testing were randomized. A stationary bike warm-up was followed by assessment of maximal voluntary isometric contraction (MVIC), by surface electromyography (sEMG), of bilateral lumbar multifidi and the dominant leg gluteus maximus, medial and lateral hamstrings, and medial and lateral gastrocnemius muscles. Correlation analyses assessed the relationship between hamstring performance on the NB NHE versus ID for peak torque (PT), average torque (AT), and sEMG measurements. Body-weight adjusted

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between sex differences in muscle performance on each test were assessed with unpaired t-tests. RESULTS: Knee flexion PT-BW ratio was greater during the NB NHE ($p = 0.048$). Muscle (sEMG) activity of bilateral multifidi and the gluteus maximus was greater during the NB NHE ($p < 0.05$). Greater sEMG activity of the biceps femoris, semitendinosus, and lateral gastrocnemious ($p > 0.05$) was present with ID testing. Correlations between the NB NHE and ID for PT, AT, and semitendinosus sEMG were high ($r > 0.7$), and moderate ($r = 0.5$-0.7) for body-wt normalized PT and other muscles' sEMG activity with exception of medial gastrocnemious ($r=0.46$) and gluteus maximus ($r=0.40$). CONCLUSION: Greater isolated HS muscle activation was present with ID while the NB NHE produced greater PT and proximal muscles activation. This information may inform exercise selection and progression for rehabilitation and testing of individuals at risk for or following hamstring injury.

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299 10:45 am AAA

Sensory Weighting of Postural Control:Implications for Fall Risk in Huntington's Disease

Makenna May, Foods and Nutrition (U)

Huntington's disease (HD) is a genetic neurodegenerative movement disorder caused by more than 36 repetitions of the CAG nucleotide sequence. HD is diagnosed between the ages of 30-50 years. Before this gene carriers are considered pre-manifest. Chorea, which is the involuntary uncontrollable dance-like jerky movements of the body, is the manifesting hallmark of HD. Other common symptoms also include personality, behavioral, and cognitive deficits. Dynamic posturography is an effective test to distinguish the movement dysfunction between pre-manifest and manifest HD. Furthermore, postural sway measurements during sensory information manipulations are of great value in understanding disease progression. However, the role of sensory information in postural control with disease manifestation remains unclear. Therefore, the purpose of this study was to understand the effect of sensory information processing on postural sway in Huntington's disease. 82 subjects participated in the study: 26 gene-negative (ARN), 20 gene-positive (ARP), 26 HD, and 10 healthy controls (HC). All subjects performed a static balance assessment using a portable force plate. 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 to examine sensory weighting: 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% CIs of the COP area were quantified. All subjects' exhibit greater postural sway with eyes closed in all directions. However, HD patients demonstrated the most significant decline in balance with their eyes closed when compared with pre-manifest (HD>ARP>ARN) and healthy control subjects. Previous studies from our lab suggest that this decline in postural control with the absence of vision is indicative of a higher risk for falls. Our findings indicate that manifest HD patients are at a higher risk for falls and are highly dependent on vision for postural control with compared with pre-manifest and healthy older controls.

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300 10:45 am BBB

Hypoxia is not Reliably Prevented by Setting a 60 Second Ppnea Limit during Exercise : The Failure of the "One Minute Rule" for Free Diving

Nader Mehregani, Kinesiology (U)

Breath-hold diving has been gaining popularity in recent years. From 2004-2015 there were 763 incidents related to breath-hold diving, 80% of which were fatal. Unlike SCUBA diving, there is no required training for free diving, making dissemination of safety protocols difficult. A recommended breath-hold dive time limit of 60 s has been put forth for amateur divers. However, this time limit is based only on anecdotal observation and should not be the primary factor of concern for preventing loss of consciousness underwater. We hypothesize that the effects of apnea time on arterial and tissue oxygenation are primarily dependent on an individual's metabolic rate and therefore aimed to measure the effect of apnea time and metabolic rate on arterial oxygenation. Fifty healthy participants (23±3 yr, 22 Females) completed four periods of apnea for 60 s (or to the tolerable limit) during seated rest and during cycle ergometry at 20, 40, and 60 W. Each breath-hold was initiated with hyperventilation to achieve $PETCO_2$ of approximately 25 mmHg to emulate diving conditions. To capture oxygenation, pulse oximetry and pulmonary gas exchanged were measured throughout. We defined hypoxia as O_2 <88%. Static and exercise (20, 40, 60 W) breath-hold break times were 57±7, 50±11, 48±11, and 46±11 s, respectively. The rise in $PETCO_2$ from initiation to breaking of apnea was dependent on metabolic rate. The same was true for the fall in SpO_2, which fell to <88% on 14 occasions in 8 participants, all of whom were asymptomatic. Independent from the added complexities of a fall in static pressure on ascent, the effect of apnea time on hypoxia depends on the metabolic rate and is highly variable among individuals. Therefore, we contend that a recommended time limit for breath-hold diving is not useful to guarantee safety.

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301 10:45 am CCC

Neuromuscular Comparisons of the Vastus Medialis in Young and Elderly Subjects during Isometric Contraction

Lam Bui, Kinesiolgy Pre-Physical Therapy (U)

The natural and inevitable process of human aging results in the decline of skeletal muscle. Aged skeletal muscle is commonly characterized with both structural (anatomical) and neuromuscular (functional) declines. While many studies have focused primarily on the anatomical changes of aged muscle, this study focuses on the functional changes and the underlying mechanisms that affect motor units of aged muscle. To investigate, motor unit recruitment and firing rates of the vastus medialis muscle of 8 'young' subjects (mean age

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20.50.76 years) and 8 'older' subjects (mean age 64.54.54 years) were recorded under isometric contraction. This was done by having each subject perform a trapezoidal muscle action at 25% and 50% of their maximal voluntary contraction. EMG signals were collected with a 5-pin decomposition sensor. Average firing rate vs recruitment threshold, initial firing rate vs recruitment threshold, force output, and common drive were the experimental outcomes to be compared between the two groups. Of these experimental outcomes, only average firing rate vs recruitment threshold yielded a significant difference as there was a decrease in firing rate in the elderly at both levels of contraction (P =1.10-13, 25% and P = 0.0034, 50%). While only one experimental outcome yielded a significant difference, it is difficult to come to the conclusion that motor units are affected by aging alone. The body has compensatory mechanisms to combat aging that were not studied that may factor into motor unit recruitment and firing rate.

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302 10:45 am DDD

Imposed expiratory resistance and pulmonary function in young healthy volunteers

Jyotika Erram, Exercise Physiology (M)

Expiratory flow limitation is a key characteristic in chronic obstructive pulmonary disease (COPD) and asthma. Increased airway resistance occurs due to bronchoconstriction, destruction of elastic tissue in the airways, and mucus hypersecretion from goblet cells caused by irritation of the epithelium. As a result, airways become narrowed. Obstruction can lead to dynamic hyperinflation, dyspnea, and exercise intolerance. In order to study abnormal lung mechanics in isolation, we aimed to test whether imposed expiratory resistance in young healthy volunteers produced deficits in the flow-volume relationship similar to that of patients with COPD or asthma.

PURPOSE Measure pulmonary function in young healthy volunteers with and without imposed expiratory resistance.

METHODS Twenty-seven participants (9 men, 7 women, 27±5 years, 170±11. cm, 71.4±13.0 kg) completed standard pulmonary function testing in control conditions and with imposed expiratory resistance at 7 and 11 cmH2O/L/s. Pulmonary function was measured according to ATS/ERS standards. Resistance was imposed with a threshold inspiratory muscle trainer installed in reverse in the spirometer.

RESULTS FEV1 was reduced ($F[(1.492, 38.79])=66.94$, $p<0.05$) with 7 and 11 cmH2O/L/s of resistance vs control (3.21±0.88 and 3.24±0.91 L, respectively vs. 4.05±0.15 L). FVC was also reduced ($F[1.599, 41.57]=68.11$, $p<0.05$) at 7 and 11 cmH2O/L/s vs control (4.11±1.09 and 4.14±1.12 L, respectively vs. 5.07±1.35 L). FEV1/FVC was not different ($F[1.865, 48.48]=3.611$, $p<0.05$) between resistance conditions. PEF was reduced ($F[1.534, 39.89]=63.61$, $p<0.05$) with 7 and 11 cmH2O/L/s of resistance vs control (6.01±1.73 and 6.20±1.92 L, respectively vs. 8.71±2.83 L).

CONCLUSIONS Imposed expiratory resistance reduced key variables (FEV1, FVC, PEF) measured during pulmonary function testing. FEV1/FVC ratio was not affected by either resistance conditions. A concave flow-volume relationship was consistently absent – a key limitation for model comparison with pulmonary function in COPD.

SRS

Abstracts of Presentations

Session C

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Session C-1

Oral Interdisciplinary 6
Friday, March 1, 2019, 1:00 pm
Location: Pride Suite

303 1:00 pm

Presence of phage-encoded Staphylococcal enterotoxin A gene in aquatic and terrestrial environments

Anh Nguyen, Biology (U)

Toxins secreted by bacteria, known as exotoxins, are highly potent and have been associated with many human diseases in the past such as foodborne illnesses, botulisms and tetanus. Exotoxin genes are carried via mobile bacterial viruses known as bacteriophage, which allow these genes to interact with bacterial hosts between various environments. Bacteriophage are successful mobile genetic elements due to their high abundance and effective use of horizontal gene transfer between organisms, resulting in a high infection efficiency. In turn, these interactions allow the transfer of genetic material that could convert nonpathogenic bacteria into virulent pathogens. Oftentimes, urban runoff contributes to bacterial contamination in local coastal regions such as beaches. In our previous studies on the changes in the temporal and spatial levels of exotoxin genes along San Diego's coast after rain events occur, results indicate that the presence of exotoxin genes were evident. In particular, the gene for the Staphylococcal enterotoxin A (sea) of Staphylococcus aureus was detected and screened from four different locations in San Diego, California. Using environmental samples collected from these locations including the: Tijuana Estuary, Dog Beach at Ocean Beach, Imperial Beach, and Scripps Beach, the sea gene was detected through the use of a polymerase chain reaction (PCR) assay designed specifically for this gene. Analysis of sea PCR products were examined and determined if their presence were positive or negative in respective samples. Molecular screenings of these environmental samples show that the sea gene is detected in both terrestrial and aquatic environments. While the presence of this gene is distributed on both land and water, its presence is more prevalent in aquatic environments. These results are significant because it shows that there may be an increase in exotoxin genes due to sewage contamination and urban runoff originating throughout San Diego. Moreover, these results suggest that phage-encoded exotoxins could be mediating the transfer of virulence genes to bacterial hosts, providing a potential mechanism for the evolution of novel human pathogens—ultimately impacting human health within these environments.

304 1:15 pm

Predicting the Fate and Transport of Pathogens in Wastewater Treatment

Lorelay Mendoza, Environmental Engineering (U)

One of the World Health Organization's sustainable development goals is to ensure the availability and sustainable management of water and sanitation for all. This includes reducing the disease burden caused by the exposure to pathogens from human excreta, which disproportionally affects those in low and middle income countries. Limiting human exposure to waste involves a risk-based approach to sanitation. Researchers have called for a pathogen mapping tool that accounts for pathogen concentrations from the generation and containment of waste, to throughout the entire wastewater treatment process. Within wastewater treatment, there is a settling process where suspended solids are removed by gravity. Basic pathogen mapping tools assume an even distribution of pathogens between the liquid and solid fractions of waste. However, we hypothesize that in reality, this is not the case. We are conducting a systematic literature review, and compiling existing data on pathogen concentrations in wastewater treatment in order to develop an accurate separation model for various settling technologies. A Boolean search containing the terms (Pathogen* OR virus OR bacteria OR protozoa OR helminth) AND (fecal sludge OR solid OR liquid OR sedimentation OR settling) AND (wastewater treatment) yielded 119 peer reviewed publications. Publications were limited to those published between the year 1970 and 2019. Initial screening of the literature has presented removal rates of 20%-90% with great variability between settling technologies. Results from this study will inform a prediction model for pathogen concentrations in liquid and solid fractions in various wastewater treatment trains. Outcomes from this separation model will contribute to evidence and risk-based tools to predict the concentration of pathogens in different sources, the level of risk that people would be exposed to, and final effluent concentrations that would be discharged into the environment.

305 1:30 pm

Using Stable Isotopes in Determining Local v. Imported Waters in San Diego County Streams

Hannah Carney, Geological Sciences- Hydrogeology Emphasis (U)

Stable isotopes of oxygen and hydrogen have been useful to trace water sources, especially within arid regions like Southern California (Williams and Rodoni, 1997). Local isotopic ratios differ enough from imported water to calculate percent tap water found within San Diego streams. The motivation is to understand differences between local and tap water endmembers will be to generate a tap water fraction found in streams (N=14 sample locations) during the dry season . Tap water fractions can be used to further understand the environmental impacts on riparian ecosystems during low flows. Furthermore, this study aims to reveal areas for further research that can enhance and contribute to the efficacy of water conservation efforts in the San Diego region.

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306 1:45 pm

Tracking of Bacterial and Chemical Markers During Storm Events in San Diego River and Its Tributary

Federick Pinongcos, Environmental Engineering (M)

During storm events, perennial urban streams in coastal regions can transform into conduits that transport land-based runoff to the oceans. In Southern California, storm events have resulted in frequent closures of beaches and other recreational waters due to exceedances of water quality benchmarks. Some of the suspected sources of anthropogenic contamination in urban waterbodies are sanitary sewer overflows, illegal connections and discharges, and wastes from homeless encampments. Temporal changes in surface water level and flood volume have the potential to inundate more contaminant source areas, thereby increasing the sources or magnitude of contaminant loadings over the duration of a storm.

The aim of this study was to compare concentrations and loadings of biological and chemical tracers of human contamination in the San Diego River (an urban river), and its tributary, Alvarado Creek. Samples were collected automatically every three hours during January and February 2018 storm events. Fecal indicator bacteria (FIB), molecular source tracking markers (e.g., HF183 Bacteroides), dissolved organic carbon (DOC) and chemical markers of anthropogenic pollution, caffeine and sucralose, were analyzed and monitored.

In January 2018, DOC loadings to the tributary and main stem of the San Diego River were three and seven times higher, respectively, than they were for a subsequent storm. In addition, higher concentrations and loadings of FIB, caffeine, and sucralose during the first storm of the season may reflect flushing of organic matter and pollutants that accumulated during the antecedent dry period. During both storm events, increases in contaminant concentrations with time in the tributary were more pronounced than in the river, where catchment area and runoff volumes were larger. This study provides information on the temporal patterns in both concentration and loadings of different anthropogenic contaminants, which is important for identifying and managing stormwater pollution in urban waterways with Mediterranean climates.

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307 2:00 pm

Metagenomic Study of the Pure Water Program in San Diego, CA

Amanda Pham, Public Health (M)

The City of San Diego is currently embarking on a surface water augmentation project called Pure Water. The plan includes the diversion of wastewater from Point Loma to the North City Water Reclamation Plant (NCWRP), where it will be treated to meet recycled water quality standards. The water will then undergo a series of advanced water purification treatment steps at the North City Pure Water Facility (NCPWF). The steps in this treatment train include ozone (O3), biological activated carbon (BAC), micro or ultrafiltration (MF/UF), reverse osmosis (RO), and a UV-based advanced oxidation process (UV/AOP). The resulting product is discharged into the Miramar Reservoir, where it will be blended with water from other sources. Water derived from the reservoir will receive further treatment for potable use. By 2035, the Pure Water project will constitute nearly one-third of San Diego's drinking water supply. Current testing strategies for the Pure Water project measure only a few bioindicators, such as E.coli, making it difficult to assess the broad spectrum of microbes and viruses in the Pure Water treatment process. This research project utilizes shotgun metagenomics to identify and characterize the microbial community of each treatment step. Samples are collected from every step within the advanced treatment process. DNA is extracted and library preparation is conducted. The samples are then sequenced using the Illumina MiSeq. A set of bioinformatics tools is then used for data analysis. The goal of this study is to deepen our understanding of what effect each unit treatment process has on the microbial communities, with a particular interest regarding to the survival and propagation of antibiotic resistant bacteria. With metagenomics, managing an analysis of the overall water quality can create headway towards the safety and application of Pure Water.

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308 2:15 pm

Quantifying the Impacts of Vegetative Channel Maintenance on Hydraulic Processes

Kyler Stevenson, Civil Engineering - Water Resources Engineering (M)

The San Diego River Watershed has been altered by urbanization as well as non-native vegetation, changing the stream channel hydraulics, hydrology, and water quality. The San Diego River Watershed is an urban Mediterranean stream system, where flooding and water quality concerns have increased. This has prompted interest to improve the health of urban waterways through riparian restoration and returning channels back to a natural state. Alvarado Creek, a tributary to the San Diego River, was used as a pilot site for riparian vegetation restoration and the collection of regular hydrologic and hydraulic data to monitor the stream's response. In 2016, over 65 tons of non-native vegetation and approximately 8 tons of anthropogenic refuse were removed from a 4000 ft-long, natural bottom, reach of Alvarado Creek. After restoration, field-based measurements included continuous 10-minute stage height, streamflow, stream temperature, seasonal surveyed channel cross sections and grain-size distributions, upstream and downstream of the reach. This research developed the United States Army Corp of Engineer's Hydrologic Engineering Center's River Analysis System (HEC-RAS 2D) for Alvarado Creek. Hydraulic modeling was conducted using two model scenarios: 1) existing non-native vegetation and urban channel conditions prior to riparian restoration, and 2) riparian restoration with non-native vegetation removed. The field-based streamflow and precipitation data were used to calibrate and validate the developed models to represent hydraulic. The surface water elevation and depth, flow velocity, and flooding extents were simulated for the 2-, 5-, 25-yr storm events for the pre- and post-restoration scenarios. Model results were used to quantify the improvement capacity of vegetation restoration, and provide insight for future mitigation strategies of flooding in similar urban environments.

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Session C-2

Oral Interdisciplinary 7
Friday, March 1, 2019, 1:00 pm
Location: Park Boulevard

309 1:00 pm

The key to identifying San Diego's fairy shrimp

Andrea Albarran, Biology (U)

Although vernal pools once covered ca. 200 square miles in San Diego county, an estimated 97% of them have been destroyed due to land development for housing, urbanization, agriculture and grazing. Coastal vernal pools in this region are home to the endangered "San Diego fairy shrimp" Branchinecta sandiegonensis, which is a flagship species for the vernal pool ecosystem. The "versatile fairy shrimp" Branchinecta lindahli is a generalist, that can tolerate a wide range of pool conditions, including some B. sandiegonensis pools. These species can hybridize in both laboratory and nature, leading to unclear species boundaries. Male hybrids are difficult to distinguish, but a morphological hybrid index has been developed for females. However, the female key to pure species and hybrids does not provide good photographs or visual aids to interpret the characters. Using stereo microscopy, I experimented with a variety of lighting techniques to obtain photographs that clearly differentiate both males (using – secondary antenna characters) and females (thoracic segments characters). These results will serve as reference tools for a researchers and environmental consultants who seek to correctly identify fairy shrimp in coastal San Diego county.

310 1:15 pm

Effects of a non-native swimming crab on the native California horn snail

Melissa Belen-Gonzalez, Biology (U)

Ecologists have established the importance of fear, in which predators may scare their prey. This may cause non-lethal trait mediated interactions such as the prey species reduced foraging rates or change in the prey species growth. Due to climate change and zones of tropicalization during El Niño conditions, new interactions may be forming between native species and non-native species experiencing range expansion. This study used the predatory non-native swimming crab (Callinectes bellicosus) to determine the possible effects on the native California horn snail (Cerithidea californica). Study organisms were collected within the local San Diego salt marsh and placed within laboratory setting mesocosms to observe C. californica climbing rates in the presence and absence of C. bellicosus. Prey organism C. californica was kept safe from actual C. bellicosus predation but will still be exposed to visual and chemical cues. It is believed that C. californica will climb higher in the presence of C. bellicosus than in the absence of C. bellicosus cues. The study suggests that there are non-native predatory species experiencing range expansion and affecting the native prey species as an indirect influence of climate change.

311 1:30 pm

Community Metabolism of Eelgrass Beds in the San Diego Bay: Carbon Sink or Source?

Abigail Ryder, Ecology (M)

Atmospheric CO2 is higher than it has been in the last 800,000 years and is expected to continue to rise due to anthropogenic emissions. Urban areas are responsible for up to 70% of current greenhouse gas emissions and therefore there is a need to seek local solutions to combat a global challenge. Because coastal margins play a disproportionate role in oceanic carbon absorption due to marine production from vegetation such as seagrasses, port cities such as San Diego may have a unique opportunity for climate mitigation by conserving and restoring this habitat. However, there is a knowledge gap in the extent that seagrasses contribute to carbon services, particularly along the West Coast. This study aims to quantify carbon fluxes in the San Diego Bay by measuring gross community production, community respiration, and the resulting net community production in eelgrass beds and bare sediment plots via benthic incubation chambers containing dissolved oxygen sensors and carbonate chemistry bottle sampling. Here we present preliminary data from August, September, October, and November deployments at a site in the Southern San Diego Bay, where most eelgrass habitat in the bay is located. Our data indicate that bay beds act as carbon sources with negative net community productivity (NCP) during all months. We believe these 'source' values are indicative of bed senescence and anomalously warm temperatures during the times of deployment. These deployments will continue to be conducted on a monthly basis throughout the year to determine the role of seasonal variation. Further research should be undertaken to determine the influence of site, water temperature, hydrodynamics, and anthropogenic impact, among other variables, on seagrass carbon metabolism.

312 1:45 pm

Assessing the distribution and impact of marine endocrine disrupting compounds in the critically endangered California condor and marine mammals

Margaret Stack, Environmental Health (M)

After nearing extinction in the 1980s, California condors have rebounded in the past decades due to breeding and conservation efforts. Currently, two populations comprised of nearly 400 individuals exist in the wild: inland and coastal-dwelling groups. Coastal habitats are advantageous because they better align with the historic habitat range of the condors and the availability of marine mammal prey allows for their independence from anthropogenic sources, such as livestock or hunted carrion. However, there is increasing evidence that marine mammals are highly susceptible to bioaccumulation of persistent organic pollutants (POPs). These pollutants can cause a range of adverse health effects in wildlife, particularly as endocrine disruptors. Recent studies have indicated that coastal California condors are experiencing eggshell thinning, which may potentially be caused by ingestion of these POPs by way of marine mammal consumption. If such thinning continues, coastal populations will be inhibited

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in becoming self-sustaining and free of their reliance on human intervention. Our study aims to identify the contaminant profiles of inland and coastal condors, as well as those profiles from marine mammals in Southern California and Baja California, through the use of novel non-targeted chemical analysis using two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (GCxGC/TOF-MS). The results will provide dietary exposure assessments of the two populations, as well as indicating which region contains marine mammals that pose a greater health risk. Further, the study has the potential to identify previously unknown contaminants that may be affecting coastal wildlife more broadly than only the condors. Preliminary results of the project examining 3 coastal and 3 inland condors showed that coastal condors contained significantly higher ranges of contaminants than their inland counterparts (52-83 contaminants/sample vs. 9-10 contaminants/sample). Finding a suitable, healthy habitat for California condors is critical to their reintroduction and survival, and this project provides data to inform those management decisions.

313 2:00 pm

Thesis Proposal: Efficiency, Affordability and Scalability of Technologies for the Recovery of Phosphorus from Wastewater

Emily Saban, Environmental Engineering (M)

Wastewater treatment facilities in the United States process approximately 34 billion gallons of wastewater every day. Wastewater contains nitrogen (N) and phosphorus (P), along with other components, from human waste, food waste, and certain soaps and detergents. Furthermore, one of the largest sources of nutrient pollution is storm water runoff from agriculture and landscaping practices. With 32 states, serving approximately 40 million people, operating combined sewer systems (CSS), nutrients from fertilizers, pet and yard waste ends up directly in the influent of water treatment facilities.

The importance of understanding the fate of nutrients removal within water treatment facilities is two-fold. The U.S. National Pollutant Discharge Elimination System (NPDES) is issuing more stringent permits of water reclamation plant effluent discharge limits with the goal of eliminating eutrophication in the nation's waterways. Second, P is a non-renewable resource that is essential for modern agricultural practices. According to the U.S. Environmental Protection Agency (USEPA), more than 100,000 miles of rivers and streams, close to 2.5 million acres of lakes and ponds, and more than 800 square miles of bays and estuaries are affected by N and P pollution. Water reclamation plants are being forced to spend capital in order to achieve greater removal percentages of these nutrients but are not seeing their removal efforts turn profit for the utility. Technologies are emerging to recover and transform P into a readily-applicable form of fertilizer. This approach to water treatment is directly aligned with the Water Environment Federation's mission to make wastewater a "utility of the future", shifting toward recovering marketable resources rather than only treating to permitted effluent levels. However, drawbacks to these technologies include high startup and maintenance costs, as well as long pay-back times for the utility. There is a need to normalize the costs associated with P-recovery technologies in order to streamline comparisons across the technologies. The goal of this research is to characterize the efficiency, affordability, and scalability of several P-recovery technologies. The results of this research will help wastewater authorities to select the most appropriate technologies to use for their particular context.

314 2:15 pm

Quantification of Non-Point Source Contaminants from Homeless Encampments in a Semi-Arid Urban Watershed

Jose Calderon, Civil Engineering Environmental Engineering (M)

There is little knowledge about the extent of contamination to urban waterbodies from homeless encampments, even though it has been postulated to be a problem, especially in urban California watersheds. Homeless individuals often lack access to basic water, sanitation, and hygiene services, and commonly practice open defecation. The aim of this study was to estimate the loading of chemical and microbial contaminants from sites within homeless encampments that have evidence of open defecation. We developed a method to quantify the loading of contaminants from simulated stormwater runoff. Two sheets of metal were placed along the sides of an area of soil with evidence of open defecation, and a third curved metal sheet aided to distribute 700 mL of synthetic rainwater (pH of 5.4 – 5.7) as sheet flow across the fecal matter and surrounding soil. Sites with evidence of open defecation were flushed 15 times, and runoff was collected using a standing dustpan placed on the downhill side of the demarcated area. Samples were tested for nitrate, phosphate, caffeine, sucralose, E. coli, enterococci, and human-associated microbial source tracking (MST) markers, including HF183 Bacteroides. River water samples were also collected directly upstream and downstream of homeless encampment sites. Soil hydraulic conductivity was measured using a mini disk infiltrometer.

Total coliform concentrations from simulated runoff experiments were only slightly greater than E. coli concentrations. Results show no discernible increase or decrease in the concentrations of fecal indicator bacteria or MST markers after 15 consecutive flushes, suggesting that fecal material is a constant source of these contaminants during consecutive rain events. The results from this study can be used to model the impact on contaminant loadings to the river with respect to interventions designed to reduce homelessness or improve access to sanitation and hygiene services within the homeless population.

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Session C-3

Oral Interdisciplinary 8
Friday, March 1, 2019, 1:00 pm
Location: Tehuanco

315 1:00 pm

Changing subsistence patterns: How the second industrial revolution impacted life at the Harrison Homestead

Jamie Bastide, Anthropology and Geological Sciences (U)

The second industrial revolution brought change across the nation as transportation and technology advanced. No better evidence for this can be seen than in California, where residents found themselves able to obtain goods from a variety of sources to supplement their agrarian lifestyle at more reasonable prices. By analyzing the artifacts excavated during multiple field seasons on Palomar Mountain, the Nathan "Nate" Harrison Archaeological Project shows how Harrison was able to enhance his subsistence with nonperishable food items gained either personally or through gift exchange.

316 1:15 pm

A Culture of Self-Medication and the Nathan Harrison Site

Leah Hails, Anthropology (U)

Nathan Harrison, a legendary figure in local lore, is often viewed as separate from, yet fundamentally linked to the rural San Diego County community in the late 19th and early 20th centuries. Prior to the proliferation of prescription medication, numerous readily available medicines advertised relief from ailments and illnesses for the everyday American. The intersection between industry and the Wild West via railroads, in an increasingly global world, allowed goods to become accessible to rural communities through catalogues, and thus, consumers like Harrison. Home remedies, combined with deficient access to professional medical care, resulted in self-medication and the instigation of a cultural obsession with novel medical treatments for a multitude of afflictions. Analysis of artifacts, excavated from Harrison's homestead site, provide insight into his life and unique perspective within the broader economic and social contexts of American society at the turn of the century.

317 1:30 pm

Traditional Chinese Philosophy and Toxic Masculinity

Sarah Camara, Linguistics (U)

Toxic masculinity is a widely discussed topic in the media and in academia; how it affects women and how to combat it. I will be suggesting a philosophical strategy to combat toxic masculinity, through Traditional Chinese Philosophy. This will be done through examination of source texts from Daoist, Confucian and Buddhist philosophers and their overarching values. Not only does this show the importance Chinese Philosophy can have in the Western world, but also provides possible solutions to toxic masculinity such as self-care, emotional cultivation, and identifying one's true self that may appeal to many men.

318 1:45 pm

Food, Nostalgia, and Home on the U.S./Mexico Border: The Palimpsest of Memory in the Creation of Home and Imagined Futures

Sandra Kirkwood, Anthropology (M)

Food is more than sustenance. Using a mix of qualitative and quantitative methods, this research analyzes the role of food among those who self-identity with Mexican heritage in San Diego, CA. Migrants living in the United States are separated from their home communities in Mexico, and food is an important way to connect to one's heritage and identity. Memories of home and food involve all the senses and, in this research, evoke emotions of love and comfort. The research focuses on the preservation of Mexican identity and traditions in the U.S. while simultaneously allowing for new influences. Results show the importance of creating opportunities for nostalgic memories, which privilege childhood and inter-generational relationships, in order to pass Mexican identity and knowledge to the next generation. They highlight the strong ties between food, family, and home, as well as the agency and creativity of cultural performers.

319 2:00 pm

The Parent Role in the Families of Parachute Kids from Mainland China

Kimberly Gan, Sociology (M)

As students in Mainland China face high levels from stress due to high values placed in education and the competition caused by an exam-oriented education system, one alternative route that urban families have opted for in pursuit of a secondary education is to take their children abroad. However, due to familial and business obligations, parents send their children without them in which they become "parachute kids" or unaccompanied minor students. While previous studies mainly focused on the struggles of parachute kids from Taiwan and Korea, this study focuses on an overlooked population, parents of parachute kids from Mainland China as the involvement of parents does not simply end once the child goes abroad. This qualitative pilot study conducted open-ended interviews in which 10 parents of parachute kids (5 parents of current students abroad and 5 parents of perspective students) participated. Through these participants, insights were drawn from interviews via the grounded theory approach. Findings revealed that parents similarly experience stress through the process of sending their children abroad. Common themes showed that parents shared strong motives, similar preparation tactics within their respective groups, concerns, and responses toward their children going abroad.

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

320 2:15 pm

The Paradox of Tourism on Easter Island: Helping and Harming Rapa Nui Culture

Jesse Tenenbaum, Geography (M)

Forces of globalization and a history of colonialism have brought Chilean people and culture to Polynesian Easter Island, and the indigenous Polynesian residents - known as the Rapa Nui - are working against these forces to revive and maintain their Polynesian language and cultural practices. Tourism is Easter Island's main economic activity, and is both a blessing and a burden on the island. The capital that the industry brings is needed and greatly appreciated by Rapa Nui residents, as it allows them to improve their material standard of living in addition to investing in education and programs to celebrate their culture and heritage. On the other hand, however, tourism strains the environmental resources of the island, and the large number of foreign tourists and Chilean mainland residents moving to the island are threatening to dilute the Rapa Nui language, traditions, and cultural practices.

This study addresses the tensions produced by tourism on Easter Island, focusing specifically on the tensions between Chilean and Rapa Nui identities. This qualitative study consisted of 3 months of fieldwork on Easter Island, where the author collected semi-formal interviews and surveys with Chilean and Rapa Nui residents of the island, in addition to archival work, with the intention to fill the gap in Easter Island literature in geography and contribute a new case study in processes of tourism management, identity, and indigenous relations.

Session C-4

Oral Interdisciplinary 9

Friday, March 1, 2019, 1:00 pm

Location: Aztlan

321 1:00 pm

The Impact of Commodity Price and Volatility on Deforestation in Suitable Regions

Alicia Marquez, Environmental Science (U)

Global deforestation has increasingly become one of the most pressing environmental problems facing the earth. From habitat loss to greenhouse gas emissions, deforestation has numerous and substantial negative social and environmental impacts. The two primary drivers of deforestation include agricultural expansion and logging operations. These practices produce numerous consumer goods and respond to changes in market demand. As commodity markets change, it is expected that an effect could be seen on deforestation in the regions suitable to produce such commodities. To what extent changes in market prices and commodity price volatility drives deforestation in the tropics is not yet fully understood. This research will examine the relationship between commodity price and volatility on deforestation in tropical regions. Satellite-derived deforestation data will be analyzed on a country level for over 100 tropical countries. Global market prices and annual volatility measures will be analyzed for over a dozen commodities, including beef, soy, palm oil, and timber. The countries within the data set will be connected to the specific commodities they produce (or which they are geographically suitable to produce), and their relationship will be evaluated through panel regressions. The results will contribute to better understanding how commodity markets impact the earth through deforestation and how prices influence deforestation practices.

The data for this study has been collected and organized and is currently ready for analysis. Summary statistics for the variables of interest have been prepared.

322 1:15 pm

The Role of Motivation and Behaviorally Evoked Responsiveness in Pit Vipers

Amy Orduno-Baez, Biology with an emphasis in Ecology (U)

Pit vipers have a specialized set of sensors located under their eyes called the pit organs which allow the detection of thermal radiation in the environment. This stimulus, in conjunction with visual information in the optic tectum, enables pit vipers to visualize the infrared spectrum. Snakes that possess these organs can see and successfully attack prey in complete darkness, so long as the temperature of the prey item is greater than the ambient temperature. Although the basic functionality of the system is known, the optical parameters for thermal imaging are still unclear, and we have limited understanding of the mechanisms that make the pit organs more sensitive under certain conditions. Earlier research on southern pacific rattlesnake (Crotalus oreganus) tested snake responsiveness to moving stimuli at various background, target and body temperatures and found that cooler snakes responded more strongly to inferred stimuli. This finding is contradictory to studies of the TRPA1 ion channel that demonstrated responsiveness increasing at higher temperatures. Numerous explanations have been formed to explain this phenomenon, including the idea that it is behavioral motivation, rather than pit organ sensitivity, that changes with body temperature. We conducted an experiment to test the hypothesis that snakes are more motivated to respond to our target stimuli at lower body temperatures. We used visual, rather than thermal targets in this experiment, so that we could directly compare results to our previous experiments. In contrast to our findings using thermal stimuli, preliminary results indicate that behavioral responses to the visual stimuli were similar at all body temperatures. Therefore, we concluded that differences in motivation to respond are unlikely to explain why cooler snakes are more responsive to thermal targets, and instead some unknown physiological aspect of the pit organ system function less optimally at warmer temperatures.

323 1:30 pm

Growth of indigenous versus hybrid corns in milpa with different soils

Cassandra Maya, Nutritional Sciences (M)

The milpa intercropping system involves simultaneous growing of corn, beans, and squash/pumpkin on the same plot of land.

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

It has been traditionally practiced in Mesoamerica to prevent soil nutrient depletion and erosion. We integrated the milpa method into modern agricultural practices, such as composting, raised beds, and drip irrigation, and compared the growth of indigenous and hybrid corns in different soils.

Red (RC), blue (BC), white (WC), and yellow (YC) corn kernels and red kidney beans were acquired from Oaxaca, Mexico. Hybrid sweet corn (HC) and pumpkin seeds were purchased from Home Depot. Each corn variety was planted with beans and pumpkin seeds in local clayey soil, compost, and a 1:1 mixture of the two. Crop growth was analyzed for 11 weeks using ANOVA and Tukey's honestly significant difference test at $P \leq 0.05$.

HC were shorter ($P \leq 0.05$) than the indigenous corns in all soil types when they reached maturity except for WC, which were not significantly different from HC. HC were not suitable for milpa as the beans outgrew the corns and in certain cases even crushed the stalks of the HC. No significant difference in plant height ($P > 0.05$) was found between the indigenous corns grown in the clayey and mixed soils. While BC and YC performed equally well in the compost, the growth of RC was stunted, and none of the WC kernels successfully germinated in the compost likely due to poor water retention. All tested corn varieties showed a trend toward taller crops in the mixed soil. The clay in the mixed soil likely provided the support corns needed to grow in raised beds while the compost added nutrients.

This study demonstrated that the milpa system can be successfully combined with urban agriculture techniques with the proper selection of soil and seeds.

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324 1:45 pm

Interspecies Hybridization in Pinyon Pines and its Consequences on Symbiotic Ectomycorrhizal Communities

Ryan Buck, Evolutionary Biology (M)

The two-needled pinyon pine (Pinus edulis) experiences among the highest mortality rates among forest species after prolonged periods of drought, which are expected to increase in intensity with climate change. Drought tolerance in pinyon pines has been associated with the presence of particular ectomycorrhizal fungi. A close relative, Pinus monophylla, has one needle per fascicle, a trait thought to be adapted to more arid environments. Both species are dominant in the Southwest and play an important ecological role in supporting biodiversity. Despite occupying different ecological niches, they have a contact zone with overlapping distributions, facilitating potential hybridization. Two additional needle types have been observed near contact zones: fallax-type and californiarum-type. Both have one needle per fascicle but have varying numbers of resin canals and stomatal rows. In this study, we will use morphological and next-generation genomic data to test for hybridization, detect the direction of gene flow, and determine the extent of the hybrid zone. Moreover, we will study how hybridization affects fungal communities. This hybridization could lead to drought tolerant traits being conferred across species barriers, resulting in drought resistant hybrids. We will examine the entire Southwestern range of these two pinyon pine species to determine the evolutionary patterns of gene flow between and among species, ultimately discovering the extent of hybridization and its consequences. Using SNPs, we calculated the fixation index (FST) to determine population differentiation by genetic structure. Population clustering was determined using a Discriminant Analysis of Principal Components (DAPC) in R. A Bayesian analysis of population clustering was performed in the software STRUCTURE. Our FST and DAPC results support P. edulis and P. monophylla being independent species, californiarum-type possibly being a result of hybridization between the two, and fallax-type possibly being its own species. Our STRUCTURE results suggest that californiarum-type and fallax-type share the same chloroplast, contradicting the nuclear data's suggestion that fallax-type was a separate group. This contrasting chloroplast-nuclear data show a potential chloroplast capture event, supporting the hypothesis of hybridization and implying a possible hybridization between P. monophylla and fallax-type.

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325 2:00 pm

Phylogenetic Reconstruction and Population Structure Analysis of the Genus Arbutus Using Next Generation Sequencing

Alexandra McElwee-Adame, Evolutionary Biology (M)

The genus Arbutus (Ericaceae) exhibits intercontinental disjunction. Three species of Arbutus are known to occur along the Mediterranian Basin and another ten are distributed throughout Mexico and the West Coast of the United States, with distinct morphological differences present between the two continents. Previous studies have indicated that Arbutus may form a paraphyletic group within the subfamily Arbutoideae, with species from the same region exhibiting a closer phylogenetic relationship to each other. In addition, species occurring in North America have been identified to exhibit two distinct spatial distributions: sympatry (overlapping distribution) among mainland Mexican species and allopatry (non-overlapping distribution) in Arbutus menziesii, spanning from the central Californian coast up to Vancouver, British Columbia residing in eight distinct ecoregions.

The discovery of new species and the reclassification of controversial taxa have called for a phylogenetic reconstruction and population structure analyses of Arbutus. Through the analysis of single nucleotide polymorphisms (SNPs) and morphological data, our project aims to improve our understanding of the phylogenetic relationship among the members of the genus Arbutus as well as how species that occur in sympatry and allopatry have evolved. We hypothesize that species found on the same continent will show a closer phylogenetic relationship to one another. In the case of overlapping distribution, we hypothesize that species will display high levels of admixture; whereas non-overlapping species such as A. menziesii might be more distantly related to the rest of the species. Moreover, A. menziesii could display genetic structure across ecoregions. We expect the genus Arbutus to display paraphyly within the phylogeny of the subfamily Arbutoideae. As for species growing in sympatry, we

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expect to see high levels of admixture, indicating hybridization across the species A. bicolor, A. xalapensis, A. occidentalis, A. madrensis, and A. tesssalata. In the case of A. menziesii, we expect to see a gradient with genetic information, with those situated in the center of an ecoregion to be more structured than those between ecoregions.

326 2:15 pm

The Virtual Standardized Patient

Helina Hoyt, Education (D)

Nurses care for complex patient scenarios and thus must be trained to prioritize care in a high-stakes environment. To achieve this, nursing education relies on simulation to provide standardized and safe clinical experiences. Traditional nursing simulation modalities are proven effective across levels of nursing education for transforming students from novice to expert through student engagement in authentic, active, and realistic practice. Unfortunately, traditional simulation modalities are often equitably cost-prohibitive. Innovation in immersive technology provides a new modality for high quality simulation that is more affordable than traditional devices. Early studies indicate immersive technology is an effective modality to deliver educational simulation, however the existing research is not yet conclusive. This quantitative study, framed by Benner's Novice to Expert Theory, the NLN Jeffries Simulation Framework, and John Keller's Theory of Motivation to Learn, was a collaboration between San Diego State University's Instructional Technology Services and School of Nursing at both the San Diego and Imperial Valley campuses. Participating students (n=161) across three levels of nursing courses were stratified and randomly assigned to a Virtual Standardized Patient (VSP) anaphylaxis simulation research group that was delivered by three different teaching methods. Research group one consisted of a video simulation via traditional two-dimensional video plus a written case study (n = 54). Research group two consisted of a three-dimensional mixed reality VSP simulation via the Microsoft HoloLens® (n = 53). The control group consisted of a only a written case study (n = 54). Participants completed an instrument measuring knowledge, skill, and motivation to learn related to the delivery of the anaphylaxis scenario. Analyses of covariance and regression showed differences in student knowledge, skill, and motivation to learn between teaching modalities. These results indicated video production plus a written case study provided the highest degree of knowledge and skill. In regards to motivation, results indicated the immersive simulation and two-dimensional video modalities resulted in increased student motivation compared with the written case study alone. These results have significant research, practice, and policy implications for nursing school faculty and administration seeking affordable and authentic simulation to teach low-frequency, high-risk scenarios.

Session C-5

Oral Humanities, History, Literature, Philosophy 2
Friday, March 1, 2019, 1:00 pm
Location: Metztli

327 1:00 pm

Marx v Stirner on Freedom

Mija Pritchard, Philosophy (U)

In my research paper I propose that Max Stirner's conception of freedom is not compatible with Communism because it is deeply flawed in it's own right. As humans, we are frightfully alone without our historical situation, we are only as individual as our circumstances require, and freedom useful as it can be used to access what we desire and exclude what we are not fond of becoming or enduring. Karl Marx and Max Stirner would agree on this point, but where they differ must be in the determination of what is 'not ourselves'. With this in mind, our exploration of freedom begins on one of two fronts:

"on the one hand, as power, as domination over the circumstances and conditions in which an individual lives — by all materialists; on the other hand, as self-determination, riddance of the real world, as merely imaginary freedom of the spirit — this definition was given by all idealists." (Marx & Engels, 301)

I assess whether Max Stirner's German Idealistic conception of Freedom is compatible with Marx's Communist Utopia through analysis of Marx's chapter entitled "Saint Max" from The Leipzig Council. In conclusion, Marx offers the true self as the body freed from the oppression of others, opposing Stirner's definition of the true self to be the body freed from the oppression of its situation, something that has never been achieved and is likely to remain as such. Stirner's definition of freedom is unrealistic and poses no threat to Marx's concept of communism.

328 1:15 pm

The Implications of "Believe All Women:" An Epistemological Critique of the "Me, too" Movement

Thomas Gustafson, Philosophy (M)

My research centers on the implications of the excesses of the "Me, too" movement for philosophy. In particular, the research shows how one of the movement's key dictates, "Believe all women," has dire consequences for epistemology, logic, and ethics. Respectively, the mantra contradicts key tenets of philosophy by adding a gendered criterion to knowledge claims, appealing to categorically unqualified authority, and transforming Rawls' veil of ignorance into a robe of awareness. While many of the goals the movement aims for are important, I argue that such excesses of "Me, too" actually undermine the goal of social justice and the integrity of the academy.

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329 1:30 pm

Marx on Gender

Tawny Whaley, Philosophy (M)

The scope of this research examines why Karl Marx left the question of gender and domestic labor untheorized. While there is evidence that demonstrates that Marx may have believed that over time distinctions based on race, age, and gender would dissipate, this may have left some unintended consequences. Silvia Federici argues that Marx's silences on women's reproductive work may have left us with only a viewpoint of the masculine. The problem raised by Federici is that even though Marx condemned patriarchal relations, other Marxist philosophers may have taken his silences on reproductive work as a justification for treating race and gender as cultural phenomena. Marx believed that the violence and brutality of capitalism were a progressive force in creating the conditions of production necessary to establish the basis of a higher form of society. The problem that arises is what there is to say about reproductive or domestic labor. Reproductive and domestic labor are essential for creating and establishing a labor force for capitalism. While Marx does discuss the 'generational reproduction of the workforce' he excludes discussion of domestic work and biological reproduction. It exposes a history of women that has been ignored. Women have been expected to reproduce and provide for children for hundreds of years. Women's unpaid labor cannot be viewed as a natural vocation and nothing more. Women have been working second shifts for hundreds of years and fight to this day to have their domesticated labor count for more than some unpaid task they are obliged to do. While it is important to recognize the places where Marx remained silent on women or domestic issues, it is also important to examine Marx and Federici's work through the lens of feminist thoughts and movements. Karl Marx has inspired many feminist movements in claiming power and autonomy over their labor-power (paid or unpaid). This research aims to expose pathways into understanding unpaid domestic labor in a capitalist society. This research also aims to demonstrate how feminists and activists have taken Marx's ideas of exploitation of the worker to fight for gender equality.

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330 1:45 pm

Post-truth and Epistemic Hedonism

Brandon Walton, Philosophy (M)

The notion of truth is a perennial topic of concern in the history of philosophy. Epistemically, truth is an imperative component of genuine knowledge. To know such-and-such is the case requires such-and-such to actually be the case—failed attempts or inaccurate assertions, however persuasive or sincere, fall short of knowledge. Knowledge implies, indeed, necessitates, truth; and although belief is also present where knowledge is concerned—that is, one who knows that such-and-such is the case also believes that such-and-such is the case— beliefs themselves do not necessitate truth. Though truth remains implied, even presumed, the criteria for a belief, qua belief, is much more inclusive; whereas knowledge is gained through diligent adherence and fidelity to the facts, beliefs come at a much lower price. If one believes a falsehood, or claims to believe in something they know is false with the intention of persuading others to form the same belief (now a sincere belief), the content of such a belief would hastily assume the status of knowledge, and therefore be held as true—to hold a belief is to hold that it is true; humans do not hold beliefs which they know are false.

Truth is important and ought to be the goal of every inquiry. The problem is, however, that we often conflate believing with knowing, a limitation that is taken particular advantage of in current trends of media and politics. The infamous "Tobacco Strategy," the decline of traditional media and rise of social media, the pervasive and alluring attitudes of postmodernism misapplied to science, "fake news," and extant cognitive biases which serve as obstacles for critical thinking, all serve to undermine the notion of truth. Truth is just what one wants to be true: this is post-truth.

In a post-truth environment, many people are imprisoned by their prejudices and cognitive biases; truth is not the goal. But we are responsible, in several senses, for our beliefs and claims to knowledge. Lack of concern for truth, I argue, is to live the life of an epistemic hedonist.

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331 2:00 pm

Epistemic Suicide: Foucauldian "instruction" on the structure of institutional racism within the field of study in anthropology at San Diego State University

Monica Gonzalez, Philosophy (M)

Are a nexus of powers and constraints between the apparatus of the academic institution and the student body. My research deconstructs the epistemic structure of Michel Foucault's oeuvre on the disciplinary power of the Enlightenment. Although Foucault points to the mechanisms of the disciplines as elegant, I situate the instrument of the gaze as salient ground for the institution of racism. I further that Foucault's conundrum on the gaze misdirects the apparatus of the academic institution in motion, submitting the student body and its forces to revolve around its axis of disciplinary power. My focus is to substantiate how biased beliefs shift the kinds of knowledge everybody perceives about anybody as something rather than nothing. As a result, I raise sensible standpoints on the epistemic suicide of the philosopher within the interiority and exteriority of knowledge as a model for student body resistance to the institution of race.

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Session C-6

Oral Engineering and Computer Sciences 5
Friday, March 1, 2019, 1:00 pm
Location: Templo Mayor

332 1:00 pm

Isolation Improvement of Two Dual-band 900 MHz Planar Inverted-F Antennas

Tommy Khoury, Electrical Engineering (U)

The optimization of two dual-band 900 MHz Planar Inverted-F Antennas (PIFAs) positioned atop a metal plate structure has been investigated for antenna isolation improvement. In this case study, height and positioning of antennas are known constraints. In varying the location and/or dimensions of the feed shorting pins, incorporating slots on the antennas, and changing substrate material properties, antenna isolation has been improved. A bandwidth of at least 100 MHz is achieved to support both cellular and ISM bands, a return loss of at least 10 dB was realized for acceptable radiation performance, and isolation of 20 dB or more has been obtained to ensure minimal signal interference among radiating elements thus improving antenna efficiency.

333 1:15 pm

Wireless sensor network with IoT frameworks for sleep monitoring

Kim Phan, Electrical Engineering (M)

The Internet-of-Things (IoT) is a fast-growing technology trend, which creates a new approach to managing, maintaining, and enhancing user experiences. In smart health devices, unobtrusive data acquisition method draws the interest of researchers because of its high impact, not require any technical training, and cost-effectiveness. This study proposes an IoT-based system for sleep monitoring. The IoT node captures coarse and fine body movements. The fine movements are due to chest wall motion during respiration. The system is scalable, easy to connect to any available network, and does not require any physical contact. It offers the subjects a comfort sleep time. The ambient sensor unobtrusively acquires the movement signals and transmit them to our private cloud server. Our cloud server receives and process data from multiple sensors. The proposed system can simplify the process of tracking sleep and facilitate to store, manage, and process data. The IoT solution can be easily reconfigured to acquire a signal for other biomedical sensor and integrate with the sleep sensor device.

334 1:30 pm

Wide Angle Beam Steering Cylindrical Parabolic Reflector with Phased Array as a Feed Source for Ku-Band Applications

Ghanshyam Mishra, Computational Science (D)

A 3D metal printed cylindrical parabolic reflector is investigated at Ku-band for wide angle beam steering using phased array antenna as a feed source. The parabolic cylindrical reflector provides wide beam scanning at low f/D compared to a conventional parabolic reflector antenna. In addition to wide beam scanning, the sidelobe level can also be reduced by distinct control of the excitation weights. Also, the cost of the beamforming components is reduced significantly due to less RF components. The wide angle beam scanning is achieved in a single plane along the cylindrical axis. The stacked patch antenna array is used to illuminate the reflector and is arranged along the focal line of the cylindrical axis of the reflector.

The cylindrical parabolic reflector surface is generated in MATLAB and analyzed using Ticra GRASP. The maximum dimension of the reflector is 50 cm and is placed in an offset arrangement with f/D = 0.4. The stacked patch antenna is analyzed in Ansys HFSS to provide wide impedance matching bandwidth, low cross polarization and stable radiation pattern from 12 GHz to 15 GHz. The phased array of size 8 × 4 is used to illuminate the cylindrical parabolic reflector. The peak directivity of the secondary pattern is around 27 dBi and an overall beam scanning of ±35° is achieved along the cylindrical axis of the reflector. The simulated reflector will be 3D metal printed and the effect of finite conductivity, surface roughness and strut effects will also be analyzed.

The phased array feed source is steered using the integrated analog beamforming network (BFN). Beam steering is achieved using Ku-band Anokiwave AWMF-0117 integrated silicon core chips. The chip features half duplex operations with +20 dB transmit channel gain, +28 dB receive channel gain with 3 dB noise figure. 6-bit amplitude and 6-bit phase controls are included with low RMS amplitude and phase errors. The fabricated BFN board will be assembled with the 3D metal printed cylindrical parabolic reflector and the scan performance will be experimentally verified.

335 1:45 pm

Studies on mechanical deformation fundamentals in nanoscale pure metal magnesium using supercomputer-based simulations

Md. Shahrier Hasan, Engineering Science(Mechanical and Aerospace) (D)

Pure metal magnesium is one of the lightest metals on earth. This makes magnesium and its alloys as one of the most promising base materials for lightweight structural applications. However, its strength and stiffness need to be improved for broader applications. Nanotechnology is proved to be a very efficient technique to improve the mechanical properties of metals. Thus, in this work we employ computer simulations to systematically investigate the mechanical properties of

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magnesium at the nanoscale, providing theoretical knowledge that can be used to design high-performance nanoscale magnesium-based materials.

In particular, classical molecular dynamics simulation method is used to study the uniaxial tensile deformation of nanocrystalline magnesium of varied grain size levels. The mean grain size of the sample is varied from 6.4 nm to 45.0 nm with each sample containing about 43 million atoms in the modelling system. Such a large number of atoms in the models necessitates the use of supercomputers in our work. From the computer simulations, the grain size dependence of the key elastic mechanical properties including elastic modulus and ultimate tensile strength are obtained and analyzed. The elastic modulus and the ultimate strength are observed to be highly sensitive to the grain size as both demonstrated a steady increase with grain size from 6.4 nm to 45 nm. Furthermore, the tensile nanomechanics of the deforming atomistic systems are observed and the main deformation mechanisms are identified. The yield stress and dislocation density for varied grain size are also quantified. The quantification analysis of dislocation and analysis of elastic mechanical properties may facilitate the manufacture of high strength magnesium and its alloys for their application as low-density structural materials.

336 2:00 pm

A Novel Bandwidth Allocation Scheme Using Stackelberg Game for Wireless Communication

Krishna Murthy Kattiyan Ramamoorthy, Computational Science (D)

Multimedia Quality of Experience (QoE) is a prominent factor that drives customer satisfaction and user experience in wireless communication. For example, Dynamic Adaptive Streaming over HTTP (DASH) has been widely adapted for multimedia content delivery over internet which allows the customer to choose the bitrates of the subsequent frames based on the channel condition. Service Providers (SPs) normally allocate service to their customers on a bandwidth or throughput basis. Therefore, the multimedia QoE has largely been ignored. In our research, we developed a Stackelberg game-theoretic spectrum allocation approach for QoE-centric wireless multimedia communication. Here, we introduce the cost of using the spectrum as a factor in the utility of the SP and the client device. Both service provider and customers are assumed rational and selfish, looking to maximize their utility in a non-cooperative manner. This utility maximizing problem is defined as a two stage Stackelberg game. The game is used to formulate the interaction between the service provider and the customer, and to derive the Nash Equilibrium. Nash Equilibrium of the game is defined as the set of strategies, one for customer and one for the service provider such that both players have no incentive deviating from that strategy. The existence of such an equilibrium is proved mathematically and a generic global searching algorithm has been developed to derive the set of strategies that maximize the utility of both customer and the service provider. Simulation results indicate that both QoE and fairness can be achieved by the proposed spectrum allocation scheme.

337 2:15 pm

Toward a Smart Stethoscope: Correlation between trachea internal air pathway geometry and the auscultation signal response

Mohamed Amine Abassi, Mechanical and Aerospace Engineering (D)

Human auscultation represents an easy and prompt tool for physicians to diagnose rapidly the existence of a pulmonary disease. A digitalization of the acoustic signal acquired by a stethoscope would help us circumvent the subjective nature of clinical pulmonary auscultation. So far, the physics that stands behind the generation of acoustic signals by air breathing and the internal geometry of the trachea or lung air ways has not been clearly defined. In our project, we started to tackle the problem using a microphone, and instead of carrying out experiments on human beings, we chose to use a 3D-printed model based on geometry data collected from a real human patient. Our main purpose is to understand how the geometry of the trachea wall interacts with the air flow and thus, impacts the acoustic signal acquired by the microphone.

The range of a typical frequency of tracheal breath sound varies from 100 to 1,500 Hz (M. Sarkar et al. 2015). To carry out our experimental measurements, we use an artificial air pump to simulate the respiratory process in the trachea. The acoustic signal is conditioned and low-pass filtered at 3000 Hz, then processed using Labview. The signal is then analyzed using spectral analysis methods as implemented in Liu and Katz (2013, Vortex-corner interactions in a cavity shear layer elucidated by time resolved measurements of the pressure field, J of Fluid Mech., 728, 417:57) to establish the correlation between the tracheal acoustic signal and its internal geometry.

Session C-7

Oral Behavior and Social Sciences 10

Friday, March 1, 2019, 1:00 pm

Location: Visionary Suite

338 1:00 pm

Performing Masculinity as a Stroke Survivor and Advocate

Marcella Anderson, Foods and Nutritional Sciences (U)

Surviving stroke is a medical accomplishment; being a stroke survivor is a communicative one. Through communication with medical professionals, family members, friends, and others who have experienced stroke, stroke survivors (re)negotiate their identities in response to changed (and changing) embodied realities. Stroke survivors experience cognitive challenges, including aphasia (a language disorder that makes it challenging to remember and articulate words) and difficulties controlling and expressing emotions (i.e., stroke survivors may laugh or cry without a clear reason). In addition, stroke survivors experience various levels of physical impairment. For men who are stroke survivors, (re)negotiating a post-stroke identity also

involves responding to toxic, ableist notions of masculinity (Cherney & Lindemann, 2014; Lindemann, 2010; Lindemann & Cherney, 2008). When masculinity is defined as being both emotionally stoic and physically strong, stigmatizing discourses of disability constitute particularly devastating identity threats. Indeed, in comparison to the general population, individuals who survive stroke are twice as likely to die from suicide (Eriksson, Glader, Norrving, & Asplund, 2015; Pompili et al., 2015; Teasdale & Engberg, 2001). Certainly, ableist notions of masculinity may compromise stroke survivors' physical and emotional well-being. In this paper, however, we consider how performances of masculinity might also support recovery and resilience. We draw on a series of in-depth interviews with Bill Torres, a prominent stroke advocate in San Diego who managed to recover nearly completely from a severe stroke. We also conducted interviews with Bill's friends, with his healthcare providers, and with other men stroke survivors who interacted with Bill during their recovery journey. We explore the ways in which participants' narratives of survivorship, recovery, and advocacy reflect, reinforce, and problematize traditional notions of masculinity.

339 1:15 pm

No, It Should Be a Boy: The Outcome of Gender-selective Abortion Policy in Contemporary China

Yuwei Liu, International Business (U)

Imbalanced gender ratio has become a crisis in China, largely due to the "son preference" of many families and gender-selective abortion of female infants. As a result, Chinese government has adopted proposals against gender identification during pregnancy and female feticide. Through quantitative and qualitative evidence, this research study examines the outcome of gender-selective abortion policies in contemporary China. Based on feminist political theory and gender-based policy analysis, this research paper introduces the cultural background of "son preference", the imbalanced infant sex ratio resulting from gender-selective abortion in China, and if current policies are effective in resolving such issue in China. The research will focus on specific time period when other population policies are enforced, such as the one-child regulation. It is important to understand that female feticide is a gender-based violence and progressive policy changes on such type of violence. Being a Chinese national, the author explores the topics above from academic and non-academic resources in order to understand how political theories associate to the policies against gender-selective abortion in her home country.

340 1:30 pm

Perceptual and Attitudinal Body image, Disordered Eating and Muscularity-Orientated Behavior in Men

Boyu Wei, Psychology (U)

Introduction: Eating disorders are an increasing concern among men. Body image concerns among men, including body and muscle dissatisfaction, have been associated with greater disordered eating and muscularity-oriented behavior (e.g., steroid use), and are a risk factor for the development of an eating disorder and muscle dysmorphia disorder. To date, studies have considered the role of body image attitudes (i.e., satisfaction or dissatisfaction with one's body or appearance) or perception (i.e., estimation of one's size or shape) in the development of eating pathology, however the unique contribution of these predictors and their association with muscle-building behaviors, are yet to be investigated. The aim of the present study was to investigate the unique associations between perceptual and attitudinal body image concerns with disordered eating and muscle-building behavior among men.

Method: Undergraduate adult men (N = 308) completed an online battery of self-report measures assessing body image, eating and muscle-building behavior. Generalized linear models with a gamma distribution were used to assess associations between perceptual and attitudinal body image and the outcome of disordered eating, and general linear models for the outcome of muscle-building behaviors.

Results: Increases in negative body fat and muscularity attitudes were uniquely associated with greater disordered eating and muscle-building behaviors. Perceptions of higher current ($B = 0.11$, $p = .003$) and ideal muscularity ($B = 0.12$, $p = .009$) were uniquely associated with greater muscle-building behavior, and perceptions of higher current muscularity were uniquely associated with greater dietary restraint ($B = 0.18$, $p < .001$). Perceptions of lower current ($B = - 0.10$, $p = .004$) and ideal body fat ($B = - 0.11$, $p = .001$) were also uniquely associated with greater muscle building behavior.

Conclusion: Perceptual body image concerns were incrementally associated with disordered eating and muscle-building behavior, over and above attitudinal body image concerns. The current study highlights that clinicians and body image researchers should consider inclusion of both measures of attitudinal and perceptual body image concerns. A better understanding of the unique roles that different body image concern dimensions have in maladaptive behaviors may inform body image treatment efforts.

341 1:45 pm

Women's Experiences of Communicating Intimacy and Sex Education

Sarah Tellesen, Communication (M)

Sexual relationships present a unique context for communication because intimate partners may encounter vulnerability, excitement, expectations, and topics not discussed in other relationships. While scholarship acknowledges the difficulty many people find in sexual communication, most research has not explored the ways that communication and sexual pleasure may be enhanced or constrained. Further, women experience distinct constraints to sexual communication with intimate partners due to stereotypes about women and their sexuality. Based on sensitizing media and data gathered from qualitative interviews, this research investigates the experiences and needs of women regarding communication with intimate partners. The findings of this research offer implications for the future of sex education, as well as potential sites of intervention for communication scholarship.

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

342 2:00 pm

Predictors of Intimate Partner Violence (IPV) among Peruvian Men: An Ecological Perspective

Maria Milla, Dual Masters of Public Health and Latin American Studies - Health Promotion (M)

Background:

Violence against women is recognized as a significant public health issue and one of its most common forms is intimate partner violence (IPV). Peru is one of the countries with the highest prevalence of IPV in the world, with 65.4% of ever partnered women having suffered some form of IPV in 2017. Research on male to female perpetration of IPV in middle and low-income countries is lacking and there is a gap in research on perpetration from the male perspective.

Purpose:

To assess the relationship of multilevel factors with the perpetration of physical, sexual and emotional intimate partner violence (IPV) by Peruvian men age 18 or older in five cities in Peru.

Methods:

This study was a secondary analysis of cross-sectional data collected by the Instituto Nacional de Salud Mental "Honorio Delgado-Hideyo Noguchi" (INSM "HD-HN") in Lima, Peru from males and their current female partners. Perpetrators were identified based on their female partners' answer to questions regarding IPV. The dependent variable, IPV, is multinomial with three categories: no violence, physical and/or sexual, and emotional. The survey also assessed previously identified risk factors for IPV perpetration at three of the levels of the ecological model of abuse: individual, relationship and community. The relationship between risk factors for IPV and their joint contribution to IPV perpetration will be tested using survey weighted multinomial logistic regression. The results of this analysis will be shared at the symposium.

Preliminary Results:

Preliminary bivariate analysis of individual level factors shows that men's alcohol consumption and machista attitudes are significantly related to IPV perpetration ($p < 0.001$).

Additional Information:

In order to obtain access to the data from the INSM "HD-HN" I travelled to Peru to fulfill a required 1-month in-person internship. This allowed me not only data access but also interaction with the research staff. As a result, I refined the research question to one that is more innovative and attempts to fill in gaps in current research.

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343 2:15 pm

Amor y Frontera: Naming the significant other among Mexican female Spanish speakers

Fernanda Vega, Women Studies (M)

As language shapes behavior and patterns of interaction within cultural and communicative frameworks across groups, it becomes crucial to observe how the linguistic resources at hand construe and/or limit social changes and any possibilities to imagine different sociolinguistic dynamics among language users. The purpose of this study is to examine lexical variation when referring to a sentimental partner among female Spanish speakers, that is, the terms that these speakers tend to use or prefer when referring to a spouse, partner, significant other, etc., in distinct scenarios and when speaking with different interlocutors. There are two main axes –which interrelate– for the analysis conducted: pragmatic and sociolinguistic. The former includes contextual variation (e.g., situation, participants, level of formality) and the latter focuses on identity and geographic location, that is, whether speakers consider themselves as fronterizas (people who live near and/or have a cultural tie to the US-Mexico border) or Mexicans away from such border. Other social variables included are exposure to the English language, age, and education. Data was obtained through a survey administered online. This paper will present preliminary results of such survey.

The relevance of this research lies in the need to determine current patterns of language use and possible English influences on border Spanish in order to better understand regional differences in female speech; in this case, focusing particularly in one area of social dynamics, that is, terms used to refer to a sentimental partner. Some studies claim a disconnection between terms of endearment and their literal meanings; however, this research aims to contest this idea, by discussing, from a gender studies/feminist perspective, existing differences between signifier and sign. Furthermore, this investigation aims to contribute to documents patterns of language use or change in specific areas within the fields of Hispanic Sociolinguistics and Pragmatics, especially given the fact that research on female Spanish speakers' speech in border regions is scarce.

Session C-8

Oral Behavior and Social Sciences 11

Friday, March 1, 2019, 1:00 pm

Location: Legacy Suite

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344 1:00 pm

Communicating Sexual Violence in FratMANers to Create Change

Harsh Varshney, Health Communication (U)

Studies indicate that "as many as 25 to 28.5 percent of women and 14 percent of men may experience sexual assault while in college" (Suran, p. 274, 2014, p. 274). It is important for college students to engage in conversations about sexual violence because it helps create an environment where rape culture is deconstructed. Communicating and raising awareness about sexual violence leads to a reevaluated rape culture that can reduce and eliminate victimization. There is an increase in the number of programs designed to create a more supportive community that advocates for the prevention of sexual violence. Ethnography is the best method to investigate what conversations are being constructed and how they communicate sexual violence. Through observations and

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interviews, this study addressed the question: How do fraternity men communicatively construct conversations about sexual violence? Future research should investigate how rape culture is perceived in our society and the language communicated to contribute to rape culture.

345 1:15 pm

This is OUR Church: A study of community in a local San Diego church

Raegan Jobe, Health Communications (U)

Some may think of church as a burden or something like a chore but community is the strongest part of any church context. Having a sense of belonging and community in the Christian church is something that Christians deeply treasure and intend to incorporate within social interactions. Church can be used as an outlet for people for a multitude of reasons. Some of these people may use the church as a coping mechanism for current stressors in life while others may use the church in order to feel a part of a community. This research paper investigates how people use church, specifically a local San Diego church called All Peoples Church, to provide themselves with a sense of community and how others have discovered their existing faith in their religion as a healing process from a major, life-altering crisis. Through communicating passion, communicatively creating a vulnerable and open environment, and using communication in altruistic behaviors, church members are able to communicatively construct community. All of these communication patterns prove to be crucial for appropriately and naturally constructing community and creating a sense of peace and belonging through the church. The fact that I was not an official member of this church and was raised going to a traditional Catholic Church, I went into my research with judgments and doubts about All Peoples Church. I believe it could prove worthwhile for future research to have a partner who is not religious at all. With no biased opinions or judgments, it would be important for further research to include different insights into the questions I raise.

346 1:30 pm

Communicating A Way Out: A Qualitative Study of a Queer STEM Community

Kaysia Pajita, Health Communication (U)

At every university, the number of student organizations is constantly on the rise. Students are ideally searching for a space where they can express their identities and interests with like-minded people. However, for LGBTQ+ individuals, there is a perpetual struggle of whether or not to "come out" in their field, which can make these types of interpersonal connections a daunting task. Establishing a sense of community is a complex, multi-layered process that involves deeper work than simply finding commonalities in a group. Throughout this process, communication is central to forming these relationships and connections with others. To better understand this process of constructing community through involvement in a club that is focused on supporting queer students, we employed ethnographic methods to study the "Out in STEM" - or oSTEM for short - club at San Diego State University. This research draws on weekly observations of oSTEM's chapter meetings, and interviews were conducted with participants who were proponents of oSTEM's objectives. In our study, we discovered that members of oSTEM build community through communicative echoing and communicative identification; both of which can be complicated under certain circumstances.

347 1:45 pm

"Every Time She Opened Her Mouth I Was Scared… How Do I React?! What Do I Say?!" Exploring Dialectical Tensions in Confidant Perspectives of Social Support to Survivors of Sexual Assault

Danielle Biss, Communication (M)

Drawing from qualitative data gathered from 25 confidant interactions with female survivors of sexual assault, this paper empirically illustrates discursive contradictions in confidant perspectives of social support and advances theoretical considerations of relational dialectical tensions. Research has offered little insight to the discursive challenges, and importantly contradictions, from confidant perspectives in their effort to provide social support to female survivors, oftentimes significant others, family members, friends, students, and colleagues. The analysis proposes four dialectical tensions emerge for confidants who become the recipients of sexual assault disclosures: (1) revealing vs. concealing pain, (2) openness vs. closedness of information, (3) privileging positionalities as a survivor vs. confidant, and (4) uncertainty vs. certainty of efficacy of social support to survivors of sexual assault. Analysis will center how forms of social support are constrained or enabled by the negotiation of such tensions.

348 2:00 pm

"Isolating Myself from the Rest of My Life," An Analysis of Institutional Discrimination of Feminine-Identifying in the Evangelical Church

Kara Sutton, Communication (M)

This study examines the constraints feminine-identifying members of evangelical churches face. Research reveals the constricted roles that women are confined to in evangelical churches. However, most of these studies have not focused on the internalization of these heteronormative roles specifically from the way these constraints are communicated to the members by other members. After interviewing ten women who have had past experiences in an evangelical church, I thematically analyzed their narratives to determine what communicative patterns were present, looking to the way these constraints are communicated and responded to. I draw upon the theory of concertive control to clarify the unique type of oppression women face. Specifically, I argue these constraints have layers of control through a value-based system of rules, self-rationalized by female members. These results are potentially generalizable to communication in religious

institutions and therefore are critical to understanding the institutional discrimination, directed towards women, forming in those communities.

349 2:15 pm

"Nobody Wants to Listen to Girls Talk": Communicative Strategies for Resisting the Male-centric Industry of Stand-up Comedy

Laura Horton, Communication Studies (M)

Comedy shows have always been a wonderful way for people to unwind and enjoy a good hard laugh, but the world of stand-up comedy is no joke. The industry is very competitive and often exclusive towards women and other minority groups. Despite the challenges, female comedians are pushing their way into the boy's club that is comedy. This research employs narrative interviewing to gain a better understanding of what organizational challenges female comedians face and how they use communication to push back against misogynistic power structures that support this industry. The results reveal that benevolent confrontation, femme-focused comedy, and (wo) mentoring are discursive tools used by female comedians to create discursive spaces where they can thrive personally and professionally. As women fight for equal treatment in all parts of our society, this research focuses on exploring how professional female comedians navigate unique occupational constraints that withhold comedic success from women as well as other performers who are differently gendered.

Session C-9

Poster Behavior and Social Sciences 12
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

350 12:30 pm A

Navigating Cancer Care: Causal Beliefs and Treatment Choices at the US-Mexico Border

Mariela Rodriguez, Psychology (U)

The relationship between scientific and other explanatory systems is a central question for cognitive psychology. Researchers have often presumed that scientific knowledge eventually replaces intuitive or folk 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 beliefs is often seen when individuals are confronted with a life-threatening illness, such as cancer which lacks a clear explanation or cure. This study examines the co-existence of different beliefs related to cancer among Mexican-Americans residing near the US-Mexico border in Imperial Valley, CA. This binational context, where people frequently cross the border for healthcare services, is a unique region that provides an ideal location for us to examine both cultural and structural factors that influence healthcare beliefs and treatment choices. To examine these questions, we surveyed 20 college students in the Imperial Valley about their beliefs regarding cancer. The survey included open-ended questions about the nature and cause of cancer as well as more structured questions in which participants were asked to endorse potential causes and treatments, including biomedical, culture-specific and alternative options. Participants' acculturation to U.S. and Mexican cultures was measured using the ARSMA-II. Demographics such as education, language, and SES were also assessed. Since we were testing college students, there was the possibility that we would not find much variation in acculturation or endorsement. However, because this is a binational and bicultural region, we believe it is possible to see the endorsement of biomedical as well as culture-specific beliefs, regardless of their performance in their acculturation level. Our analysis revealed that biomedical beliefs and treatments were equally endorsed among both US- and Mexican-identified participants. However, US-identified participants were less likely than Mexican-identified participants to also endorse alternative beliefs systems. In future studies, we will test non-student adults in the same region and a comparison group in Mexicali on the other side of the border. The results may inform the design of cancer education and treatment programs for this and similar populations.

351 12:30 pm B

Building Bridges: Inter-racial Dynamics of Organizers of Color

Joshua Hudson, Sociology (M)

Studies on social movements and community organizing often focused on predominately Black organizations and not enough on their interactions with Latinx or Asian organizations. Though multi-racial coalitions are not a recent development, there is little research that focuses on coalitions between Blacks, Latino/a, and Asian/Pacific Islander (API) activists in movements with intersecting issues such as immigration, environmental racism, and criminal justice. Political mobilization of Blacks, Latinx and Asian-Pacific Islanders challenge the existing social institutions in terms of power, legitimacy, and political rights; however, political solidarity between Black, Latinx and API communities as well as low-income communities is still difficult to achieve. For this qualitative project, I will observe three local multi-racial community organizations and interview 10 community organizers. The study will explore the interactions between the activists, organizers and staff members, their perceptions of the social justice issue at hand, and their involvement within the organization. The research will provide a richer perspective on multi-racial community relations, intending to open dialogue on framing movements among communities of color as well as conceptualize and identify new linkages between marginalized groups.

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352 12:30 pm C

Recent Alcohol Consumption and Treatment Adherence Among Binational HIV-Positive Latinos in the U.S-Mexico Border Region

Nafisa Ferdous, Interdisciplinary Research on Substance Use (D)

There is an emerging health concern of excessive alcohol use among young adult Latinos (ages 18–34) with binge and heavy drinking episodes of alcohol affecting the physical and emotional well-being of adult Latinos. Previous studies have reported associations between drug and alcohol use and HIV transmission risks. A large urban binational Latino population reside in the San Diego and Tijuana border region where individuals conduct their lives in both countries. Tijuana has an estimated number of people between 1,803 and 5,472 living with HIV. Alcohol consumption among people living with HIV (PLWH) has been shown to reduce treatment adherence. We undertook the current study with HIV-positive Latinos to understand the role of alcohol in HIV care engagement and treatment adherence. The parent study involved a cross-sectional study with a convenience sample of HIV-positive adults (N=201) recruited in Tijuana (N=101) and San Diego (N=100) who consented to answer a survey on barriers and facilitators to HIC care. We hypothesized that reports of alcohol consumption will be associated with antiretroviral therapy (ART) adherence. To test this hypothesis, descriptive statistics were computed for demographics, alcohol consumption, and ART adherence. Associations between alcohol consumption in the last 3 months and ART adherence were determined by Pearson chi square at $p < .05$. Our analysis revealed that during the last 3 months 40.3% (n=81) reported never consuming alcohol and 32.8% (n=66) reported alcohol consumption. Adherence was generally high with 63.7% (n=128) reporting to have never missed their daily dose of antiretroviral (ARV) medication while 25.4% (n=51) reported to have forgotten to take their daily dose of ARV medication, sometimes or most of the time, in the last 1 month. In bivariate analysis we found that individuals who reported consuming alcohol in the last 3 months were more likely to forget their ARV medication during the last month when compared to individuals who reported to have not consumed alcohol in the last 3 months ($p=.042$). Alcohol consumption in this population of HIV-positive Latinos is of concern and merits further assessment to determine potential alcohol use disorders and drinking patterns that may undermine health.

353 12:30 pm D

The Socialization of Resilience in Internally Displaced Persons Resettlements in Georgia

Tiana Hodzic, Psychology and Women's Studies (U)

The current study is a feminist cultural psychological study conducted this past summer in Tbilisi, Georgia. Ethnographic interviews were conducted in three different internally displaced persons resettlements in Georgia. The study specifically analyzed women's experiences in protracted displacement to understand how women's strategies of resilience are socialized onto the next generation. Effective strategies of resilience were identified through psychosocial factors of resilience. The study was based on a model the researcher generated which understands both resilience and trauma as potential products of vulnerability. The study hypothesized that unaddressed trauma becomes socialized as trauma rendering negative consequences on the next generation, and trauma addressed with effective strategies of resilience becomes socialized as resilience rendering positive consequences on the next generation. The study recognized women's gendered roles in care work and reproductive labor. The results cite the important role NGOs have played in aid and relief. The results emphasize the need for psychological aid as a part of humanitarian aid, especially in resettlements in which the geographical location poses as a vulnerability stressor. The hypotheses were supported in the study, as the results showed negative consequences in the youngest generation from unresolved trauma and positive consequences in the youngest generation from effective strategies of resilience. Two other socializers which were identified in the results which competed as primary socializers of trauma were media and education. The impact and weight of these socializers was related to the effectiveness of women's strategies of resilience.

354 12:30 pm E

Female Migration from Paraguay to Argentina

Stefanie Trompeter Rolon, Public Administration and Latin American Studies (M)

This project investigates the factors motivating female Paraguayan migration to Argentina. While existing migration literature explores the role of economic conditions, social networks, and other factors, I hypothesize that the availability and ease of accessing government provided services in Argentina is an increasingly important factor driving migration.

The sources of data for this project are existing studies on migration from Paraguay to Argentina, data from government offices, fieldwork observations, and informal conversations with Paraguayan migrants. Observations and informal conversations occurred during two preliminary research trips to Paraguay and Argentina in August 2017 and August 2018. I compiled the data I collected during my fieldwork into detailed fieldnotes.

These studies and data source emphasize economic factors and social networks as the principal factors motivating migration. The existing literature also points to the freedom of movement across the border that is afforded by the MERCOSUR agreement and other immigration policies that resulted from this agreement. However, no studies have yet considered the influence of government-provided services on Paraguayan migration to Argentina. Argentine census data show that female migrants are continually surpassing male migrants, and the number of Paraguayan migrants in general has continued to increase since Argentina's first census in the late 1800s. Through my field observations and conversations with female migrants, I found that women were aware of government-provided services in Argentina, and actively

sought access. In field visits to government offices in Paraguay and Argentina, I was able to compare the level of government provided-services in both countries in order to better understand the incentives that Argentina's more extensive social service provision presents for female Paraguayan migrants.

Based on the information I gathered during the preliminary research phase, I am confident in my hypothesis that the availability and ease of accessing is a leading, understudied, and underappreciated motivating factor for women in this migration case. Further research in this case should more fully evaluate the attraction of government-provided services as a major factor driving permanent migration from Paraguay to Argentina.

Session C-10

Poster Behavior and Social Sciences 13
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

355 12:30 pm F

Evaluation of Dating Abuse Resource Knowledge at SDSU

Gwenyth Crise, Public Health (U)

Though prior research has been conducted on sexual abuse on university campuses, there is little research dedicated to dating abuse. Large universities, such as San Diego State University (SDSU), have entire administrative departments dedicated to sexual abuse prevention. These departments are also tasked with providing aid and resources to victims of relationship abuse. Historically, students have been exposed to a significant amount of information regarding universities policies and resources pertaining to sexual abuse from these departments. Despite this, students typically receive little information about policies regarding relationship abuse. Thus, an evaluation of student awareness is needed to implement better strategies by health service administrative departments. The purpose of this research was to evaluate the prevalence of first-year students involved in abusive relationships, the extent of their confidence in having interpersonal conversations about dating abuse, and the magnitude of the existing student population's perception on available resources.

Data came from structured, online surveys with 49 SDSU students participating in the survey. The surveys were distributed by a link from various General Education professors. Data from the Campus Climate Survey on Sexual Assault and Sexual Misconduct 2015 was used to understand the competence rates of lower-classmen to upperclassmen regarding the universities' policies on sexual abuse and misconduct. Survey data was analyzed quantitatively, implementing a cross-sectional study using a correlational design approach.

Students who responded to the question, if they knew how to identify dating abuse, showed variation across answers. The majority of students who answered whether they feel confident to tell a friend about resources on campus reported feeling unsure. The most significant reporting came from the question regarding knowledge of resources if they were in an abusive relationship. More students reported not having knowledge about resources that provide aid to them if they are in an abusive relationship.

Based on preliminary results, first-year SDSU students have a lack in confidence to discuss relationship abuse with a friend as well as a lack of knowledge about relationship abuse. Additional surveying and data analysis open to all university students would further reveal a need for better resources exclusively pertaining to relationship abuse.

356 12:30 pm G

The Impact of Sexual Harassment on Job Performance Evaluations

Christina Lee, Industrial-Organizational Psychology (U)

Recently, there have been movements shedding light on the prevalence of sexual harassment in various aspects of society, including the workplace. With reports of sexual harassment becoming more known to the public, the subsequent backlash received by victims has also attracted attention. Backlash received by victims of sexual harassment in the workplace can take the form of poor performance evaluations, hostile workplace environments, and unfair treatment toward fellow employees. Previous studies have found that people who reported sexual harassment incidents experienced adverse effects, like the loss of their job, psychological distress, and lowered job satisfaction. However, research is still needed that investigates the specifics as to the prevalence, causes, and consequences of the retaliation used against people who report sexual harassment in the workplace. The present research investigates the effects of reporting sexual harassment in the workplace on the job performance evaluations. Negative performance evaluations that are given unfairly can affect an employee's future growth in a company and, in turn, incur poor work attitudes. We hypothesize that employees who had previously filed a sexual harassment report for themselves would face lower ratings on their job performance evaluations compared to employees who file sexual harassment reports for others, or those who do not report sexual harassment. In particular, we will be presenting participants with three different critical incidents describing an experience of sexual harassment in the workplace, and then evaluating participants' ratings of the performance of a target employee. Critical incidents will differ depending on whether the target employee either (a) reported an incident of sexual harassment that happened to them personally, (b) reported sexual harassment that happened to a fellow employee, or (c) there was no sexual harassment mentioned in the critical incident (control condition). This study will use Amazon's Mechanical Turk (MTurk) to gather participants from the U.S. population. We aim to gather at least 100 participants in the study. Participants will be assigned to one of the three experimental sexual harassment reporting conditions, and after reading the critical incidents will be asked to rate the quarterly job performance of the target employee.

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357 12:30 pm I

Effects of Gender-Role Violations, Sexual Orientation, and Race on Performance Evaluations of Male Targets

Adoril Oshana, Psychology: Industrial and Organizational Psychology (U)

Researchers have found that sexual minorities (i.e., those who identity with non-exclusively heterosexual identities and/or report same-sex attractions) are believed to exhibit behaviors that are atypical of their gender identities and thus violate traditional gender roles. Given the prevalence of discrimination towards sexual minorities, it is not always clear whether the discrimination they experience is based on their sexual orientation or their lack of conformity to traditional gender roles. Previous research has also not investigated whether bias towards sexual minorities extends to evaluations of their job performance. Furthermore, the role of a target person's race in studies of bias towards sexual minorities has seldom been investigated. In a few studies, heterosexual, white men and sexual minority, black men were granted higher ratings than were heterosexual, black men and sexual minority, white men. Sexual minority, black targets were favored over their heterosexual counterparts, and heterosexual, white targets were favored over their sexual minority counterparts and heterosexual, black targets. However, little is known of the intersectionality of race, gender role behavior, and sexual orientation, especially in the context of job performance evaluations. Therefore, the goal of this study is to investigate the interacting effects of sexual orientation, race, and gender role behavior on evaluations of the job performance of male targets. A 2 (sexual orientation of target: gay, heterosexual) x 2 (race of target: white, black) x 2 (gender role of target: typical, atypical) between-subjects randomized experiment will be conducted using participants recruited from Amazon's MTurk. Participants will read a cover story that varies the aforementioned independent variables, and then will evaluate the performance of the target based on his characteristics along with multiple job incidents describing the performance of the target. It is hypothesized that: (a) gender atypical targets will be evaluated less favorably than gender typical targets, (b) white targets will be evaluated more favorably than black targets, and (c) black, gender atypical, and gay targets will be evaluated more favorably than white, gender typical, and gay targets. Implications of the results will be discussed.

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358 12:30 pm J

Stigma as a Barrier to PrEP Initiation and Adherence among Young Latino Men who Have Sex with Men: A Qualitative Study

Nicholas Lucido, Public Health (U)

Background: Individuals living with Human Immunodeficiency Virus (HIV) are vulnerable to numerous diseases, including several types of cancer (e.g., Kaposi sarcoma, non-Hodgkins lymphoma, anal, oral, liver cancers). Men who have sex with men (MSM) continue to be the largest population at risk for new HIV infections, and HIV diagnoses are increasing among Latinos. Pre-exposure prophylaxis (PrEP) is a medication taken daily and is effective in preventing HIV infection, especially when used with condoms. Despite the life-saving benefits of this medication, Latino MSM are less likely to take PrEP than non-Hispanic white MSM. The purpose of this qualitative study was to identify barriers and facilitators to PrEP initiation and adherence among young Latino men.

Methods: Using purposeful sampling, 26 men, ages 18-29 years participated in semi-structured in-depth interviews assessing barriers and facilitators to PrEP initiation and adherence and completed self-report demographic surveys. Interviews were audio recorded and transcribed and a content analysis approach was used to identify both a priori and emerging themes. Two coders independently coded each transcript and then met to resolve discrepancies via consensus.

Results: One emerging theme focused on stigma as a barrier to PrEP initiation and adherence. Many participants interviewed mentioned experiencing or hearing stigma surrounding PrEP from a wide range of sources including the LGBTQ and Latino communities, individuals in the healthcare system, family and friends. Most participants stated that people who take PrEP are viewed as being sexually promiscuous. Further, participants feared taking PrEP as it could result in their being 'outed' as a gay man. Despite this widespread stigma, some participants indicated that they were empowered to take PrEP to protect their health and to be healthy for other people. Furthermore, some participants offered suggestions to reduce PrEP stigma, such as educating health care providers about PrEP.

Conclusion: Despite the significant promise of PrEP in reducing HIV infections that make individuals vulnerable to multiple cancers, certain populations, including Latino MSM, continue to have less access to PrEP. Stigma presents a significant barrier to PrEP initiation among Latino MSM and should be targeted by interventions aimed at increasing PrEP uptake.

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359 12:30 pm K

Implicit Racial Bias in Undergraduate Nursing Students

Karlye Petersen, MSN (M)

Background: Implicit bias (IB) describes the phenomena of a primal, driving force which subconsciously affects individuals' thoughts, actions, and decisions. These biases are formed over time, usually beginning at a young age, by exposure to media, social culture and stereotypes and personal experiences. Though implicit biases do not always have a negative impact on behaviors, their potential to create disparities in every aspect of daily life cannot be ignored. Future nurses, unaware of their own IB, may inadvertently extend health disparities and pose a negative impact on healthcare outcomes. With racial minorities expected to make up more than fifty percent of the population by 2056, a focus on eliminating these disparities is imperative.

Purpose: To explore the awareness and degree of racial

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implicit bias among undergraduate nursing students at San Diego State University by assessing the relationship between students' racial implicit bias as measured by the Implicit Association Test (IAT) and self- reported racial bias.

Design and Methods: A prospective, cross-sectional design with convenience sampling of 74 sophomore undergraduate nursing students was used. Students completed a self-reported questionnaire questions regarding personal feelings toward white people and black people. Then completed the online Race IAT and documented their result on the questionnaire.

Results: Ninety percent of participants self-reported no preference for white people vs black people, yet IAT result showed sixty eight percent of participants have an implicit preference for white people over black people. Correlation was rsp = .249, p = .042. Participants who self-reported no preference for white over black tended to have IAT scores that showed higher preferences for whites over black.

Conclusion: The findings suggest there is a negative correlation between self-reported racial bias in undergraduate nursing students at SDSU compared to implicit racial bias results from the IAT, suggesting there is potential for SDSU undergraduate nursing students to create healthcare disparities in their future.

360 12:30 pm L

Implicit interethnic biases are not all the same: Examining their validity at the context-level

Hannah Regal, Psychology (U)

Recently, the Implicit Association Test (IAT) has been used to examine context-levels of intergroup biases. The present research examined the internal consistency, temporal stability, and construct (convergent and discriminant) validity of four IATs assessing implicit interethnic biases at the level of metropolitan areas. Data were collected through Project Implicit. Each analysis included a minimum of 239 metropolitan areas. The selected IATs assessed the direction and strength of implicit associations between the following pairs of concepts: American vs. foreign and Asian vs. European Americans (Asian IAT) or Native vs. European Americans (Native IAT), weapons vs. harmless objects and African vs. European Americans (Weapon IAT), and good vs. bad and African vs. European Americans (Race IAT). Internal consistency, as measured by the correlation between first and second portions of the task, ranged from r = .62 (Weapon IAT) to r = .91 (Race IAT). Temporal stability, as measured by the correlations between three time periods, ranged from r = .21 (Weapon IAT) to r = .72 (Asian IAT), with the Native IAT (r = .44) and Race IAT (r = .61) falling in between. Construct validity was assessed by examining correlations between IAT scores and explicit measures, as well as the relationships among IATs. Implicit-explicit correlations ranged from r = -.10 (Asian IAT) to r = .90 (Race IAT), with the Native IAT (r = .20) and Weapon IAT (r = .43) being intermediate. Strong positive correlations were found only among the Weapon and Race IATs (r = .56) and the Native and Asian IATs (r= .49). Overall, the findings provide some evidence for the internal consistency, temporal stability, and construct validity of implicit interethnic biases at the metropolitan-level. At the same time, the data reveal important differences across tasks and do not support the notion of ethnocentrism defined as a generalized bias against ethnic minorities. The specificities of each implicit interethnic bias should not be overlooked.

Session C-11

Poster Behavior and Social Sciences 14
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

361 12:30 pm M

Correlation between Gender and Mental Illness

Jacquelynn Nguyen, Sociology (U)

In the research project titled, "Correlation between Gender and Mental Illness," the purpose was to conduct face to face interviews, as well as focus groups to locate and analyze the patterns and connections between gender and mental illness. Ultimately, this would bring awareness to both topics of gender and mental illness to those who come across the project. This topic of mental illness has held a stigma and this project makes strides in overcoming these societal barriers of stigma and ignorance towards both the topics. For gender specifically, there are older views that tend to be uneducated and unaware of the transformations of what we as society know as gender.

The research project was conducted via personal interviews conducted by head researcher, Jacquelynn Nguyen, and focus groups that had similar questions regarding the topic of gender and mental illness. These interviews and focus group had the purpose of finding correlations and bringing awareness to both the participants and the researcher about the subject.

The research project is still in the process of completion however the expected results include having societal pressures and standards be the main correlation between gender and mental illness, not necessarily monotonous with one gender but rather the entire spectrum of gender.

The topic of both gender and mental illness are very complicated in nature due to the other factors that play into the outcomes of one's mental stability and wellbeing. Interpreting the results will be further explored once research is completed yet the expected result of numerous societal pressures and standards being the main component in mental illness on the spectrum of gender calls for speculation in how we deal with these pressures and standards, whether they be stereotypes, unwarranted judgments and idealizations, if enough individuals contribute mental illness to their gender, that allows for a worrisome outcome.

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

362 12:30 pm N

Preliminary ERP evidence for different rapid feedforward orthographic and phonological masked-priming effects

Hana Zimman, Psychology (U)

Event Related Potential (ERP) studies have found that visual word recognition is carried out largely in a rapid feedforward fashion, with orthographic processing preceding phonological processing, followed by semantic processing. In this study, we used ERPs to investigate the time-course of visual word recognition in both hearing and deaf readers. Because congenitally deaf readers have less precise phonological representations we can investigate how this difference impacts the interactions between orthography and phonology. Here we report the initial results from hearing readers as data collection from deaf readers is on-going.

In a masked priming paradigm, participants performed a go/no-go semantic categorization task, pressing a button to occasional animal words. ERPs were time-locked to target words preceded by masked primes that were 60 ms in duration and separated from the targets by a 70ms SOA. Two hundred target words were presented to participants, which were either primed by themselves (Repetition Condition, e.g., party-PARTY), or by an orthographically related item (Transposed Letter Condition, e.g., syurp-SYRUP) or by a phonologically related item (Pseudohomophone Condition, e.g., brane-BRAIN). All three target conditions were contrasted with appropriate control primes.

Our analyses examined two ERP components: the N250 and the N400. The N250 and N400 are negative-going ERP waves that peak at approximately 250 ms and 400 ms after target onset. The N250 has been shown to be sensitive to sub-lexical processing reflecting mechanisms involved in processing orthography and phonology. The N400, while it continues to be affected by these sub-lexical processes, reflects lexico-semantic processes. Similar to previous studies, hearing readers produced robust lexico-semantic N400 priming effects for all three categories of priming. While the effects of repetition priming and transposed letter priming started in the early N250 epoch, the effects of pseudohomophone priming did not start until the later N400 epoch. These results are consistent with the fast feedforward model of visual word recognition and provide the baseline against which comparisons with deaf readers can be made. We predict that deaf readers will show stronger orthographic and weaker phonological priming compared to hearing readers, and that there will be differences in the timing of these effects.

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363 12:30 pm O

Identifying Tones and Sources in Hypothetical News Articles About ECS

Ranisha Hernandez, Communication (U)

Expanded Carrier Screening (ECS) is a form of genetic testing that can detect thousands of potential genetic mutations. ECS may be administered prior to conception but research indicates general confusion about implications of results. The purpose of our research was to use hypothetical news articles to determine if participants could: (a) identify positive and negative tones in articles, and (b) identify business and genetics professional sources quoted in articles. We predicted that attitudes toward ECS, intent to communicate with partner about ECS, and intent to obtain ECS would differ across experimental conditions.

A Qualtrics online survey was used to randomly assign 4 experimental media conditions to participants. The media conditions were: 1) negative tone with a genetic testing business source, 2) negative tone with a genetics professional source, 3) positive tone with a genetic testing business source, and 4) positive tone with a genetics professional source. Participants read a hypothetical news article and then responded to survey items, including a manipulation check. SONA, an online participant pool, was used recruit participants. A total of 207 students participated in this study (80.7% female, 19.3% male).

We conducted chi square tests to determine whether participants could identify differences in tone and source across experimental conditions. Participants identified the difference in tone ($\chi 2 = 64.59$, $p < .001$). Participants did not identify the difference in sources cited ($\chi 2 = 5.40$, $p = .15$, n.s.). We conducted ANOVAs to test hypotheses. Results indicate group differences for ECS attitudes [$F (3/203) = 3.41$, $p = .02$). Post hoc analysis revealed significant attitude differences between the following media conditions: (a) Negative tone-business source and Positive tone-genetics source; (b) Negative tone-genetics source and Positive tone-business source; (c) Negative tone-genetics source and Positive tone-genetics source. In all differences, positive tone conditions associated with more positive attitudes than negative tone conditions. Analysis indicated no statistically significant differences between groups for intentions to communicate about or obtain ECS.

Our survey helped us understand the way ECS is viewed based on tone and source used in hypothetical news articles. More research is needed to more accurately understand attitudes towards ECS.

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364 12:30 pm P

Medical Ethnobotany and Reproductive Modulation

Crystal Kopels, Anthropology (U)

Throughout the long history of plant-herbivore coevolution, plants evolved toxins called plant secondary metabolites (PSMs), which are largely chemicals designed to prevent herbivory. Although toxic, in regulated doses PSMs offer benefits to herbivores and humans, including: modulating parasitism; avoiding predation; maintaining thermoregulation; and enhancing cognition or reproduction. Use of traditional plant medicines for reproductive purposes is well documented ethnographically, yet there are no systematic cross-cultural studies investigating medicinal plants used to modulate sex and reproduction. In this study, we used the electronic Human Relations Area Files (eHRAF) ethnographic database

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to investigate cross-cultural patterns of plants used to modulate sex and reproduction. We used HRAF's Probability Sample Files (PSF), a randomly stratified subset of sixty cultures, to make search inquiries using Outline of Cultural Materials (OCM) codes for the following: medical care, medical therapy, or preventative medicine combined with at least one of ten topics related to sex and reproduction: abortion and infanticide; childbirth; conception; difficult/unusual birth; menstruation; postnatal care; pregnancy; miscellaneous sexual behavior; sexual intercourse; and sexual stimulation. Out of the 60 cultures in the PSF, there was 112 documents/ethnographies across 44 cultures (mean of 2.5 per culture) that contained information on plants used to modulate sex and reproduction. The distribution of documents varied by region, such that Africa (24%), Asia (25%), and North America (27%) were overrepresented; while the Middle East (.89%), Europe (5.36%), Middle America and the Caribbean (5.36%), and Oceania (6.25%) were underrepresented. Further analyses will focus on the cross-cultural patterns of plant use across three data-driven domains: treat or prevent reproductive problems; enhance sex or reproduction; and prevent conception or birth. This is the first study to systematically document medicinal plants used to modulate sex and reproduction and as such will provide the basis for future research examining biocultural hypotheses of the human exploitation of plants for reproductive purposes.

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365 12:30 pm Q

A Climatological Assessment of Burned Areas in South America

Zackary Werner, Geography (M)

This research investigates the impact of burned areas on the surface energy balance in south America. The study utilizes MODIS burned area product to create a mean burned area fraction that is it analyzed in the SSiB biophysical model. Detectable changes in sensible and latent heat flux could lead to less atmospheric convection and create a more stable planetary boundary resulting in interannual precipitation loss (De Sales et al., 2015). Not only does this work provide a better understanding of regional interannual climatic variability, it also looks to identify currently unknown spatial and temporal trends of the fire season in Brazil. This information is critical to advancing our understanding of climate forcing and the implication of wildfires under a warming future climate.

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366 12:30 pm R

Persistence of Medicinal Plant Knowledge in the Communities of Huanchaco and Huanchaquito, Peru

Francisco Hernandez, Microbiology (U)

Introduction: In Peru, the use of medicinal plants is seen as a cheaper and healthier alternative to pharmaceutical medicine. However, due to urbanization and development of modern medicine in the communities of Huanchaco and Huanchaquito, it appears that the knowledge of medicinal plants is eroding. It was hypothesized that the knowledge of medicinal plants would be higher in Huanchaquito than in Huanchaco because of the town's traditional roots. Chi-Square tests were performed on five sub-hypotheses, i.e., preference, age, years in school, time in the community, and belief in culturally-bound illnesses.

Methodology: Data collection consisted by surveying the demographics of the communities followed by questions regarding the use of medicinal plants and pharmaceutical medicines. Lastly, we asked questions regarding culturally-bound illnesses and their treatments. The information gathered was qualitative, statistical, demographic, and explanatory. Answers were used to analyze and find patterns in the communities. One-hundred surveys were conducted in each community, allowing us to gain information on individual beliefs and how it compares to findings from past studies in other communities. Chi-square calculations were used to test the five sub-hypotheses about the communities

Results: Huanchaquito's preference for medicinal plants over pharmaceutical drugs was 40%, while Huanchaco's was 30%. Huanchaco had slightly higher use of medicinal plants with 99% of the participants saying they use them; there was 98% usage on Huanchaquito. In Huanchaco, 76% of the people interviewed said their parents knew more than they did while in Huanchaquito, 64% of the people interviewed said this. The chi-square tests found that hypothesis 1 for Huanchaquito was statistically significant ($\chi 2(18)= 38.076$, p-value=0.0038) with an association between a subject's age and medical preference. However, the remaining four sub-hypotheses were not significant for Huanchaquito. In Huanchaco, the five sub-hypotheses were not supported, showing no relationship.

Conclusion: Huanchaquito had a higher knowledge of medicinal plants because of the slower erosion of medicinal plant knowledge in comparison to Huanchaco. Statistically, age and preference had a strong relationship in the use of medicinal plants in Huanchaquito, while in Huanchaco there was no relationship shown for any of the five-sub hypothesis.

Session C-12

Poster Engineering and Computer Sciences 6
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

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367 12:30 pm S

Fine-Controlling Morphology of Nanostructured Silicon Interfaces Using Magnetic Nanoparticles for Photoelectrochemical Water Splitting

Margaret Patrick, Chemistry (M)

Reducing cost and increasing the functional lifetime of photoabsorbing materials used in photoelectrochemical (PEC) water splitting remains a major challenge in solar energy conversion. Nanostructured silicon (Si) is a promising candidate with great potential to address these challenges,

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however its performance is sensitive to its interface nanostructure. The goal of this project is to achieve refined shape control during etching of silicon interfaces using magnetic metal nanoparticles. Further, we could correlate the catalytic performance towards PEC with its refined interface morphology. Current methods for producing black silicon require coating wafers in silver ions then etching in a hydrofluoric acid and hydrogen peroxide bath, resulting in straight nanoporous channels which oxidize easily, losing its activity. Preliminary scanning electron microscopy (SEM) results from samples produced by a modified metal-assisted chemical etching method using Fe3O4@Ag core-shell nanoparticles in the presence of a magnet suggest modification of the subsurface channel morphology into novel, ultra-high surface area serpentine forms is possible, potentially improving photoelectrode's performance and lifetime. Cross-sectional SEM images show samples produced with or without a magnet present, respectively, have different channel patterns. Samples produced without the magnet showed relatively straight channels, while samples in a magnetic field showed teardrop shapes on the cross-section, suggesting the tunnels curved and exited the side of the material. Optimizing the shape of the channels is key to maximizing catalytic activity. This material could be used in many renewable energy systems, including in our previously reported bioanode-photocathode hydrogen generation cell to enhance photoelectrochemical hydrogen evolution and reduce cost.

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368 12:30 pm T

Fluorescent Compounds Retained by Ultrafiltration Membranes For Water Reuse

Anita Sanchez, Environmental Engineering (U)

For the process of water reuse membrane ultrafiltration (UF) is increasingly being applied since it has shown to provide effective removal of high molecular weight compounds and suspended solids. However, a limitation to the wide usage of these membranes is membrane fouling since it necessitates periodic chemical cleaning, causes an increase in the overall operation cost, and requires a great amount of energy. Dissolved organic matter (DOM) has been identified as one of the major causes of fouling during membrane ultrafiltration, specifically the protein-like constituents. However, there is still much to be understood regarding how DOM interacts with biofilms that cause fouling. In this study, we used a pilot scale, inside-out flow, UF membrane with a 0.03 µm pore size and different synthetic wastewater solutions as feed water and verified the presence and absence of biofilms using scanning electron microscopy (SEM) technology. We evaluated the effects of biofilm formation on the retention of different organic compounds by measuring dissolved organic carbon, total dissolved nitrogen, as well as fluorescence excitation emission matrix (EEM) spectra, and peak intensities to characterize the feed, permeate, and backwash during UF membrane fouling. To evaluate ultrafiltration with and without the formation of a biofilm, unsterilized and sterilized synthetic wastewater solutions were run through UF membranes over several cycles. Results thus far indicate that ultrafiltration for both solutions preferentially removed the biologically labile tryptophan (TRP)-like components compared to the humic-like components. Furthermore, even with the elimination of the biofilm during sterilization, TRP fluorescence and bulk proteins were still removed. Therefore, the biofilm does not seem to preferentially remove proteins or have a major role in protein removal. It seems that protein removal is controlled by size exclusion as evidence by proteins being larger than humic acids. Thesefindings are important for understanding interactions between DOM and biofilms and indicate that fluorescence can be used as a semi-quantitative approach for tracking constituents that permeate and are retained by UF membranes with and without biofilm formation.

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369 12:30 pm U

Camino del Rio Drainage Channel Revisions

Jeremy Monroe, Environmental Engineering (U)

The Camino del Rio channel is one of many drainage channels in San Diego that is designed to handle stormwater from urbanized area and discharge it to the ocean. Unfortunately, that runoff comes with more than just water. Debris, sediments, and trash get carried along with the water and end up in the channel as well, which leave the channel subject to flooding during storm events because of the reduced capacity of the channel. Overtime, plants and trees grow in the channel, which also increases the risk of flooding. Flooding can damage property and cause traffic jams on right of way in channel's proximity. Our project focuses on proposed revisions and mitigation plans to the Camino del Rio drainage channel that reduce the chance of flooding. Specifically, we visited the channel several times to measure the sediment deposition and vegetation growth in the channel. Next, we assessed the channel capacity in the existing impacted condition, and compared it with our proposed maintained scenario. We used hydraulic principal to derive our scenario assessment. It is noteworthy that we incorporated Green Infrastructure in our mitigation plan, as a novel sustainable method for urban drainage.

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370 12:30 pm V

Water Table Experiment: Investigation of the interaction of a hydraulic jump and a cloud of particles

Devin Burke, Aerospace Engineering (U)

Hydraulic analogy with supersonic flow is used to understand the interaction between shock waves and hydraulic jumps with particles using water table experiments. Because of the very high-speed and short experimental time, it is challenging to obtain experimental data with high-speed windtunnels. Moreover, the costs associated with high-speed wind tunnel testing is extremely high. We therefor considered the much slower and affordable water table experiment to understand the interaction between a hydraulic jump and particles. Water table experiments are run at Froude numbers, representing

the ratio of the inertial force to the fluid weight, that are comparative to gas Mach numbers. The water table setup will be presented. Particles and their interaction with hydraulic jumps will also be discussed.

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371 12:30 pm W

Murphy Canyon Water Solution

Nicholas Steffenino, Civil Engineering (U)

Our team, Hydro Force, identified and evaluated the delineation for Murphy Canyon for storm water. We then identified a crucial channel and evaluated the effectiveness of it. Upon visiting the site, it was evident that there was a lot of vegetation that disrupts the designed movement of water. Through various means of research and calculations Hydro Force was able to provided a realistic and sustainable solution for storm water channel flow located in Murphy Canyon.

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372 12:30 pm X

Flood Capacity Improvement of Sorrento Creek Using HEC-RAS 2D

Wynneth Requieron, Civil Engineering (M)

Sorrento Valley, a business park for high tech, biotech, and scientific research, is a flood-prone hotspot in the city of San Diego. Sorrento Valley experiences flooding multiple times a year at Sorrento Creek. The flood significantly affects the businesses and people of Sorrento Valley, trapping employees and customers inside businesses, forcing the shutdown of the coaster service and access to the I-5 freeway, and causing hundreds of thousands of dollars in property damage. Maintenance has been done along the Sorrento Creek channel in 2014 and 2015. However, it has not solved the problem as flooding still occurs to this day. This study will explore various maintenance efforts to improve flood capacity in the Sorrento Creek channel and model rain events in the maintained conditions using a two-dimensional (2D) numerical simulation program called HEC-RAS. This study will be sumbitted as my research project for a Master's Degree in Civil Engineering.

Session C-13

Poster Physical and Mathematical Sciences 8
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

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373 12:30 pm Y

Synthesis of a Brighter New Nucleoside Analogue: Tricyclic Carbon Cytidine

Mackenzie Wyllie, Biochemistry (U)

Fluorescent nucleotides are vitally important molecular probes for studying maintenance, replication, and expression of the genetic code. Although many promising nucleotides have been synthesized and studied by our lab and others, they are all much less bright than conventional fluorescent molecular probes such as rhodamine and the Alexa-fluors. Brighter nucleotides that resist quenching when incorporated into DNA are necessary for new applications such as fluorescent studies of biomolecules at the single molecule level. Previously, the Purse lab has created a family of fluorescent nucleoside analogues with varying photophysical properties dependent on different substituents attached to a conjugated arene system. All modifications made to nucleosides have maintained their Watson Crick base pairing ability to preserve the genetic information when incorporated into synthetic DNA. We are synthesizing a new tricyclic cytidine (tC) analogue that has a framework of only carbon instead of nitrogen, oxygen, and sulfur in original tC structures. Tricyclic carbon cytidine (tCC) is a branch of that family with a carbon back bone allowing for increased conjugation, which is especially manifest in the 8-diethylamino (8DEA) compound. 8-DEA-tCc utilizes this increased conjugation through an electron push-pull motif, which is common in many of the brightest fluorophores. We hypothesize that this nucleoside will be the brightest available due to its increased conjugation. The synthesis scheme of 8DEA-tCc is established and successful, yet optimization is in progress to increase efficiency and provide enough of this compound for fluorescence studies. Future work includes photophysical studies on insertion into single-stranded and double-stranded DNA, as well as kinetic studies.

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374 12:30 pm Z

A Nucleoside Analogue with Solvatochromic Absorption for Sequence DNA/RNA Sequence Discrimination

Irazema Islas, Chemistry with an emphasis in Biochemistry (U)

Fluorescent nucleosides can be used as biomarkers to study DNA by fluorescence spectroscopy, but relying on absorption spectroscopy uses simpler instrumentation and may offer advantages for robust, field deployable sequence detection. Currently available fluorescent nucleosides exhibit solvatochromic properties via fluorescence emission, where their color change based on the local environment , including DNA/RNA sequence and correct and incorrect base paring. Building on our lab's research on nucleosides, we synthesized and electron deficient derivative of tCO, a tricyclic cytidine with the potential for absorption solvatochromism. To test its solvatochromicity, we chose four solvents of varying polarity: 1,4-dioxane, acetone, isopropanol, and methanol. Our test showed that methanol and 1,4-dioxane have the largest difference in absorption relative to each other. The large difference in λmax = 28 nm, suggest that the compound has strong variability for solvatochromatic sequence discrimination. Our next step is to incorporate the nucleoside analogue into DNA by synthesizing the corresponding phosphoramodite and performing solid phase DNA synthesis. Ultimately, the solvatochromic properties will report on the local conformations of DNA and single nucleotide polymorphism.

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

375 12:30 pm AA

Design and synthesis of new fluorescent thymidine analogues

Ana Shalamberidze, Chemistry (U)

While performing their essential functions, nucleic acids encounter a variety of disturbances, such as strand cleavage and ligation, local conformational changes, base damage, flipping and chemical modification. Fluorescent nucleosides continue to play a major role in the biophysical study of these processes. This research aims to add a very important but missing capability to the previously studied fluorescent nucleoside analogues: brightness sufficient to enable single-molecule biophysics and tracking labeled nucleic acids by fluorescence microscopy. These advanced features will give a foundation for future applications of fluorescent nucleosides to the investigation of nucleic acid transport, metabolism, regulatory processes and interactions with potential therapeutic agents in living cells, advance new diagnostic approaches and facilitating drug discovery. The specific aim to pursue this goal is to design, synthesize, and characterize a new emissive fluorescent thymidine analogue designed to maximize brightness red-shift the absorption and emission as compared with existing fluorescent nucleoside analogues. We designed a new tricyclic thymidine analogue with conjugated features expected to maximize fluorescence intensity and to lower the HOMO–LUMO gap, thereby red-shifting absorption and emission. The design and synthesis involves C-riboside formation, which is needed for the desired conjugated system. The main challenge of the 3-step synthesis is regioselectivity of an arene bromination needed for the Heck reaction to produce the C-ribosed. Throughout the research, multiple regioselective director catalysts were used at a high temperature, monitoring by TLC, investigating with NMR, and finally obtaining evidence for the formation of the desired isomer as a minor product. Ongoing work is directed at achieving the desired regioselectivity, which will enable us to complete the synthesis and test this new fluorescent nucleoside analogue.

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376 12:30 pm BB

Comparison of Redox-Dependent H-Bonding in Simple, Electroactive Ureas Containing Either Ferrocene or Phenylenediamine Redox Couples – Similar Results with Different Mechanisms

Ahmed Elashmawy, Biochemistry (U)

1-Ferrocenyl-3-Phenylurea (FcUHH) is a molecular system that exemplifies the concept of stimuli-responsive intermolecular interactions, where interactions such as hydrogen-bonding are influenced by external stimuli. With focus on using electron transfer to control the strength of H-Bonding interactions, we hypothesize that oxidation of the ferrocene will increase the acidity of the attached urea NH, increasing the H-Bonding strength. In this poster, challenges involved in the synthesis and purifications of FcUHH will be discussed and its redox-dependent H-bonding behavior will be compared to another simple phenylurea that contains a phenylenediamine redox couple. Through experimentation, we seek to gain a comprehensive understanding of how oxidation or reduction can affect the electrostatic properties of hydrogen bonding by either strengthening or weakening said bonding. Cyclic voltammetry experiments in an organic electrolyte solution and NMR titrations of FcUHH were conducted in the presence of 1,4-Dimethylpiperizine-2,3-Dione (PZD). Experimentally, we saw a negative shift in the E1/2 of the cyclic voltammetric wave upon addition of PZD, with little change in wave shape or height. This demonstrates that FcUHH became easier to oxidize as the concentration of PZD increased. Plots of the ΔE1/2 of FcUHH vs [PZD] are fit well using a 1:1 binding isotherm, with initial results giving estimates of the binding constants to the oxidized and reduced forms as Kred = 80 M−1 and Kox = 500 M−1. Seeing how the oxidation binding constant is much greater than the reduction counterpart further demonstrates how much more favorable oxidation has become with the addition of PZD. The results of these experiments are compared to our earlier work with 1-phenyl-3-(4-dimethylamino) phenylurea (UHH) and PZD. Our findings show that the electrochemistry is quite a bit more complex for UHH than FcUHH. However, there are also similarities between the new and old data. This poster presentation will include an in-depth analysis of the similarities and differences of both sets of data and explain how the findings are pertinent to the understand of proton and electron transfer with these types of compounds.

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377 12:30 pm CC

The Role of H-Bonding in PCET: The Chemically Reversible One Electron, Three Acid Reduction of N-Methyl-4,4'-Bipyridine Radical in Acetonitrile

Ksenia Pavlova, Chemistry (U)

Oxidation and reduction of organic redox-couples typically leads to huge changes in their acidity/basicity, with the result that proton transfer (PT) often accompanies electron transfer (ET). These types of reactions are known as proton-coupled-electron-transfer or PCET reactions. Recently, it has become apparent that H-bonding intermediates often play a significant role in the mechanism of PCET reactions. In the PCET reaction to be discussed in this presentation, reduction of N-methyl-4,4'-bipyridinium (commonly called "monoquat" or MQ) in acetonitrile in the presence of acidic alcohols, it appears that both H-bond effects are present. MQ undergoes two reversible one electron reductions in acetonitrile, the first corresponding to reduction of the starting cation, MQ+, to an uncharged radical, MQ. This is followed by a second reduction at significantly more negative potentials of the radical to the anion, MQ–, which formally contains a negatively-charged nitrogen and is thus quite basic. Not surprisingly, CV studies show that addition of trifluoroethanol or dichloroethanol, both fairly acidic alcohols, result in no change in E1/2 of the first reduction but a significant positive shift in the E1/2 of the second reduction, most likely due to protonation of the anion. The second reduction wave is slightly broad, but continues to shift positive and remain chemically reversible up to at least 400 equivalents of added alcohol, at which point it has begun

to merge with the first reduction. What is surprising, in addition to the chemical reversibility, is that analysis of the observed E1/2 as a function of added alcohol concentration is consistent with a single 1e– transformation involving three alcohols throughout the entire range. Since it is highly unlikely that the MQ anion would be triply protonated, our current hypothesis is that the product conjugate base of the alcohol forms a strongly H-bonded complex with two other alcohols. The mechanism would involve initial 1 e–, 1H+ transfer occurring through the H-bond intermediate (wedge scheme), followed by rapid formation of the homoconjugate complex (RO–)(ROH)2. The results of current and future work on this system to further elucidate the mechanism, and either support or refute the wedge-scheme/homoconjugate hypothesis, will be presented.

378 12:30 pm DD

The Electronics of DNA: Nucleoside Oxidation Potentials Determined via Fast Scan Cyclic Voltammetry

Kyle Logan, Chemistry (U)

The goal of this study, funded by SDSU's summer undergraduate research fellowship, is to measure the oxidation and reduction potentials of unmodified nucleosides and synthetic fluorescent nucleoside analogues as a function of hydrogen bonding to better understand the role of hydrogen bonding in fluorescence activation upon incorporation into single and double stranded DNA. This study also has a secondary objective of providing a quantitative relationship between molecular structure and electronic state energies, which can then be mathematically manipulated to predict the fluorescent properties of future molecules. This research was done in collaboration with Dr. Purse and his graduate student who synthesized the molecules. The oxidation potentials were measured using fast scan cyclic voltammetry in anhydrous solvents with 0.1 M tetrabutylammonium hexafluorophosphate electrolyte. Initial results prove that the oxidation potentials of unmodified nucleosides lie beyond the oxidation potentials of solvents which they are soluble in, while the oxidation potential of the fluorescent nucleoside analogue was observable in the same solvents. In order for a valid comparison between structure and electronic properties to be made, the redox potentials of the nonmodified nucleosides and the fluorescent analogues must be measured in the same environment. Given the relatively large redox window for the nonmodified nucleosides, the most viable solvent is acetonitrile; the solvent with the highest oxidation potential. However, the nucleosides are practically insoluble in acetonitrile. A CV was taken of acetonitrile super saturated with cytidine, and a small oxidation current was observed at 1.6 volts referenced versus a silver reference electrode. In conclusion, with acetonitrile being the most viable solvent to accurately record the oxidation potential of the nonmodified nucleosides, selective modifications of the ribose sugar in the nucleosides are being explored to increase their solubility in acetonitrile.

Session C-14

Poster Biological and Agricultural 2
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

379 12:30 pm EE

A New Therapy for Melanoma: VAX014 Recruits Immune Cells to Tumors

Kinsey Nelson, Biology (U)

According to the American Cancer Society, an estimated 96,480 new melanomas will be diagnosed in 2019 in the US. Various treatment methods for melanoma are being studied, including immunotherapies that elicit an immune response to fight cancer. A new treatment developed by Vaxiion Therapeutics, called VAX014, uses bacterial minicells to deliver a toxin to kill cancer cells. Due to its bacterial nature, VAX014 can also stimulate immunity. Studies in other cancers have demonstrated the success of VAX014 in triggering an immune response causing regression of tumors.

Previous studies have explored the efficacy of VAX014 in treating melanoma in the B16F10 mouse model. Significant tumor regression was observed compared to saline controls ($n=15$; $p<0.0001$). Further studies analyzed the involvement of immune cells in VAX014 efficacy by depleting various populations in vivo. Removing CD4+ T cells did not have a significant effect on tumor regression. However, removing CD8+ T cells led to a drastic decrease in the ability of VAX014 ($n=6, p<0.001$) to inhibit tumor growth. The depletion of NK cells did not show conclusive results. This research indicates that the immune response, particularly the recruitment of CD8+ T cells, is very important to the efficacy of VAX014 treatment.

We hypothesize that CD8+ T cells infiltrate the tumor and that VAX014 increases this infiltration compared to saline treated controls. In addition, we hypothesize that CD4+ T cells are less involved, but remain unsure of the role of NK cells. In this project, we aim to examine the presence of CD8+, CD4+ and NK cells in tumors after treatment with saline compared to VAX014. Mice are injected with B16F10 melanoma and later treated intratumorally with either saline or VAX014. Subsequently, tumors are harvested, processed and purified, and analyzed using flow cytometry. We expect that our results will confirm the presence of CD8+ T cells in tumors, suggesting that they are critical to the efficacy of VAX014. Preliminary results suggest that VAX014 does recruit CD8+ T cells and more studies are underway to determine the percentage of each of these immune cells in the tumor environment.

380 12:30 pm FF

CD11b+/c+ immune cell dynamics after treatment of B16F10 melanoma with VAX014

Maria Insa Prat, Biology (U)

VAX014 is a novel therapy that consists of recombinant, non-infectious bacterial minicells (BMC) engineered to target

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specific integrins on human and murine cancer cells and to deliver a bacterial toxin that results in immediate death of targeted cells. Although VAX014 was initially designed to treat nonmuscle invasive bladder cancer, preliminary studies have shown powerful tumoricidal effects against the B16F10 mouse model of melanoma.

VAX014 is not only cytotoxic to these melanoma cells, but also has the potential to affect immune responses to the tumor. Innate immunity has a complex interaction with tumors. Innate immune cells may act as either anti-tumor, helping to slow tumor growth, or as pro-tumor agents depending on the tumor environment. Myeloid cells are a well-studied example of this dual function. Normally, these cells play a fundamental role in the protection of the organism against different pathological conditions. However, in cancer, this function can be subverted, leading to an immunosupressive tumor microenvironment and consequent cancer cell survival and growth. These pro-tumor myeloid cells are called myeloid-derived suppressor cells or MDSCs. We hypothesize that part of the anti-tumor activity of VAX014 is due to an effect on the innate immune respon-se,promotinganti-tumor immunity by changing the dynamics of some immune cells. Preliminary studies show that BMC induce innate immune cell infiltration into the tumors, likely because of the bacterial origin of the therapy, but whether these cells respond to the tumor microenvironment to become pro- or anti-tumor remains unknown. To further evaluate innate immunity in melanoma in the presence and absence of VAX014, B16F10 tumors are implanted into mice and treated with VAX014 or a saline control. Subsequent to tumor removal and cell isolation, flow cytometry is used with fluorescently-tagged antibodies to compare innate immune cell populations between non-treated and treated tumors. In particular, we are interested in studying two subsets of CD45+ immune cells, CD11b+ and CD11c+, which are distinct cell populations known to be either anti-tumor in their activity or to maintain an immunosuppressive phenotype. These studies will help elucidate the effects of the oncolytic cancer therapeutic, VAX014, on innate anti-tumor activity.

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381 12:30 pm GG

Regulation of C1 Utilization

Safa Ismail, cellular molecular biology (M)

Methane oxidizing bacteria are a highly specialized type of cells that have the ability to use methane gas (CH4) as their main energy and carbon source, and they are also responsible for running the methane cycle in nature. This type of bacteria can be found in many different environments; such as marshals and rice paddies and they can also be isolated and cultured in a range of temperature (4-65 ^{o}C), pH (1-10) and saline concentrations (0-10%). The activity of Methane oxidizing bacteria is nature is greatly influenced by the human activities, such as agriculture, and thus the presents of these bacteria serves as a biofilter for the oxidization of the methane produced from different human activities.

Due to their ability to break down methane, this bacterium plays an important role in global warming. In the past decayed, methane start receiving a great deal of attention because it is an important chemical in the environment as a green house gas, and in industry as a main carbon source. While carbon dioxide is considered to be greenhouse gas number one in the atmosphere due to its abundance, methane in the other hand is 25-folds more harmful when it comes to its effect. Considering the great effect of methane in the global warming, the demand for using methanotrophs to assist in the transformation of CH4 into a higher value products such as bioplastics or biomolecules, is rising very high.

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382 12:30 pm HH

Iron reduction by Methylotuvimicrobium alcaliphilum 20ZR, a model methanotrophic bacterium

Irania Rivera, Microbiology (U)

The overall goal of this project is to investigate the ability Methylomicrobium alcaliphilum (20ZR) to use iron citrate as an electron acceptor. There are known studies in which marine sediment microorganisms can use ferrihydrite, an iron derivative, to oxidize methane1. Others show that a network between methanogens and methanotrophs might be how electron transfer is mediated through iron-coupled oxidation2. The specific aim of this project is to investigate the capability of 20ZR, a model methanotrophic proteobacteria, to reduce iron (III) citrate.

Cells of M. alcaliphilum 20ZRwere cultured in 50 ml of regular and reduced media, with iron (III) citrate as an electron acceptor, at 30 , with shaking at 200 r.p.m. 50mL of methane was administered to 250 ml with air (controls) or flushed with nitrogen to assure anaerobic conditions (experiment). Methane and oxygen consumption was monitored by gas chromatography (GC) using Model 8610C Gas Chromatograph instrument (SRI). Cell growth was monitored by measuring OD, using a Jenway 6320D spectrophotometer and by estimating the number of viable cells (CFU assay).

Current data show a decrease in methane levels in control samples. In experimental samples, samples in reduced nutrients and anaerobic conditions with iron do not show methane consumption. There was not a difference in initial and final absorbance for culture in reduced nutrients with iron, however, this was also the case for cultures in anaerobic conditions without iron present.

Preliminary data suggest that iron might be toxic for 20ZR to cells, but only at reduced conditions. This raises new questions on what bacterial machinery might be inhibiting or traumatized during the presence of iron. Considering this, future proteome and metabolic investigations will provide necessary information on why iron proves to be problematic for 20ZRendurance.

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383 12:30 pm II

Redefining the Transcriptome of the Human Spermatogonial Stem Cell

Merlin Thompson, Cell biology (M)

Male infertility is a condition that afflicts many men, but perhaps most distressingly, can be caused due to the effects

of chemotherapy or radiation treatment during a fight against cancer. While males past puberty have the option of preserving their sperm before treatment, pre-pubescent males cannot. A possible treatment option maybe spermatogonial stem cell (SSC) transplants, however this first requires the identification and culturing of the patients SSC's in vitro. Research in this area is well developed in the mice but relatively lacking in their human counterparts.

Human biopsies from healthy donors were cultured over a period of 3 weeks using a protocol that has been reported to yield healthy, proliferating SSCs. Biopsies were dissociated and enriched for SSC's using Magnetic cell sorting. Over a period of 3 weeks the cells were cultured in a serum free media with growth factors GDNF, LIF, bFGF, and EGF (on a feeder layer). Biopsies were also cultures with the addition of Erythropoietin (EPO). RNA was extracted at week 2 and week 3. Using the lab's recently published single cell sequencing data, we were able to identify several gene candidates that would be indicative of SSC activity: UTF1, EGR4, and PIWIL4. QPCR was used to verify expression of the mentioned SSC genes as well as differentiation markers DMRT1 and Kit.

This project aims to show preliminary data in the areas of developing a culture protocol for SSC's as well as expanding our transcriptomics profile of the human SSC.

384 12:30 pm JJ

Characterization of CRISPR-Mouse Model of Autism Spectrum Disorders

Jessica Gutierrez, Biology (U)

Neurodevelopmental disorders such as autism spectrum disorders (ASDs), are collection of complex disorders that differ by various genetic features. The 16p11.2 copy number variant is one of the most frequent CNVs involved in neurodevelopmental diseases. It is implicated in multiple psychiatric phenotypes with deletions associated with macrocephaly and duplications associated with microcephaly in patients and mouse models. In our previous study, we observed KCTD13-Cul3-RhoA dysregulation as a potential mechanism contributing towards these phenotypes. To further validate the role of KCTD13-Cul3-RhoA pathway in autism, we have recently created mouse models (KCTD13-HET, KCTD13-KO and Cul3-HET) using CRISPR/Cas9 genome editing technology. Further, we will use cellular phenotype characterization and transcriptomics approaches to investigate the impact of KCTD13 and Cul3 mutations on various intracellular molecular pathways in different brain regions and developmental time periods.

Session C-15

Poster Biological and Agricultural 3
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

385 12:30 pm KK

Modeling preeclampsia using induced pluripotent stem cells

Ojeni Touma, Biology (U)

Preeclampsia (PE) is a pregnancy complication characterized by new-onset hypertension with end-organ dysfunction. Placentas from patients with PE are often small, show abnormalities of trophoblast differentiation, and have increased syncytiotrophoblast (STB) apoptosis. We attempted to model this disease in vitro using induced pluripotent stem cells (iPSCs), which we established by reprogramming umbilical cord mesenchymal stem cell lines from both PE and non-PE placentas. Five cell lines (three PE and two non-PE) were reprogrammed into iPSCs and used for further analysis. iPSC pluripotency was confirmed by Pluritest (Thermo Fisher). The cells were differentiated using a previously-established BMP4-based two-step protocol (Horii et al. 2016, PNAS), by which cells are first differentiated into cytotrophoblast (CTB) progenitor cells and then replated for terminal differentiation into syncytiotrophoblast (STB) and extravillous trophoblast (EVT). Analysis of the differentiated cells was based on FACS for EGFR to quantify CTB formation. Markers of EVT and STB were evaluated using qPCR. Formation of STB was also assessed by calculating the fusion index and by hCG secretion measured by ELISA. Apoptosis was assessed by western blot for PARP and cell staining for cleaved caspase-3. While there was no difference in CTB formation, several STB markers were decreased in differentiated PE-iPSCs, including GCM1, ERVW1, and PSG4, as measured by qPCR. PSG4 was reduced most dramatically, between 11- and 92-fold in differentiated PE-iPSC's, compared to gestational age-matched non-PE iPSCs. Neither the fusion index nor the apoptosis assay showed any differences between PE and non-PE iPSC lines. Our results point to a defect in STB maturation in PE-iPSC-derived trophoblast, but no overall increase in trophoblast apoptosis. Future studies will focus on evaluation of additional markers of STB formation/maturation and assessment of apoptosis specifically in iPSC-derived STB, to further dissect the placental defects of preeclampsia.

386 12:30 pm LL

Role of Gα12, and Tissue Factor, in the in vitro growth of Human Glioma Stem Cells

Jacqueline Lara, Microbiology (M)

Glioblastoma multiforme (GBM) is the most common and lethal form of brain cancer with one of the worst survival rates of all cancers. The lab has gained considerable insight into

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the signals triggered through the S1P and PAR1 receptors, G-protein coupled receptors (GPCRs) that activate RhoA. Specifically RhoA signaling activates YAP and MRTF-A, transcriptional co-activators involved in the expression of genes involved in the growth of glioblastoma cells. We hypothesize that GPCRs for S1P and thrombin (PAR1) become and remain activated in GBM because they are continuously exposed to their ligands. We further hypothesize that it is through this pathway that glioma stem cells up regulate expression of stem cell genes and thus maintain their ability for self-renewal. To test the central role of signaling through GPCR and Ga12 in glioma stem cell self-renewal in vitrowe are using patient derived glioma stem cells (GSC)-23 and lentiviral transfection with shRNA to knockdown Ga12. We compared both glioma stem cell self-renewal (growth in limiting dilution assay) and stem cell gene expression (qPCR analysis) in shRNA control and Ga12 knockdown cells. Expression of mRNA for a number of stem cell genes (NANOG, CCND1, MYC, OCT4 and SOX2) was decreased approximately 50% when Ga12 was deleted. Similarly, data from the limiting dilution assay revealed significant loss of GSC self-renewal as assessed by sphere formation in the Ga12 knockdown cells. Tissue factor (TF), a gene downstream of YAP is regulated in response to thrombin and S1P through YAP induced gene transcription and has the potential for autocrine feedback regulation of the RhoA signaling cascade. We are currently using a similar knockdown strategy to test the role of TF in maintenance of GSC stemness. Future experiments will include in vivo studies establishing whether tumor growth is slowed and mortality from PDX cell xenografts is decreased when Ga12 or TF are downregulated. The goal is to target glioma stem cells to improve patient survival.

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387 12:30 pm MM

Physiological defects associated with expression of myosin dilated cardiomyopathy mutations in a Drosophila model

Yusur Alqaraghuli, microbiology (U)

Myosin heavy chain (MHC) is a motor protein and a component of the myosin molecule, that possesses actin binding and ATPase activity. Beta cardiac myosin (encoded by MYH7 gene) is the major isoform in the adult human heart and can be mutated and cause dilated cardiomyopathy (DCM)1 MHC protein is essential for muscle contraction. Here, we aim to better understand the mechanistic basis of myosin- induced dilated cardiomyopathy (DCM), by studying the effects of expressing two myosin DCM mutations (S532P or R369Q) in Drosophila. In our lab, mutant Mhc alleles (S532P and R369Q) were previously expressed in a Drosophila model, and muscle function was determined at the organismal level. Our previous studies determined that mutant homozygotes showed severe indirect flight muscle functional defects. Also, we observed that the R369Q mutation causes muscle functional reductions in a dominant fashion. Recently, we found that mutation in MYH7 gene that cause DCM in humans has similar effects on the Drosophila heart.

388 12:30 pm NN

The Role of Adipokines in Mediating Chemoresistance in Ovarian Cancer

Valeria Ochoa, Public Health (U)

The overall objective of this research study is to discover why chemoresistance of ovarian cancer cells is enhanced in the obese setting. Ovarian cancer is the most lethal gynecological malignancy in the United States and corresponds to over 70% of advanced stage relapse leading to high morbidity and mortality. Studies show that a high fat diet and obesity can activate NF-kB, a signaling pathway abnormally activated in ovarian cancer and important for chemotherapy resistance. It is unknown what specific inducers in the tumor microenvironment activate NF-kB in ovarian cancer cells and we hypothesize that soluble factors enriched in the obese setting, such as adipokines, trigger NF-kB activation and chemotherapy resistance. We will use ovarian cancer cells co-cultured with adipocytes to test changes in sensitivity to chemotherapy compared with ovarian cancer cells cultured alone and evaluate changes in NF-kB activation. Furthermore, we will identify and quantitate the adipokine signature before and after chemotherapy treatment in order to identify adipokines that mediate resistance to chemotherapy. These experiments will begin to clarify the molecular mechanisms whereby obesity and adipocyte accumulation can lead to NF-kB activation and chemoresistance in ovarian cancer. Ultimately, we hope to discover alternative targets for overcoming enhanced chemoresistance and disease progression in the obese setting.

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389 12:30 pm OO

Feeling the Heat: Direct measurements of microbial metabolic shifts pre-empting the rise of pathogens

Brandie White, Cell and Molecular Biology (D)

Eutrophication of lakes has long been understood as a response of algae to nutrient influx leading to hypoxic conditions and disease. However, the mechanism by which the disease becomes more prevalent remained elusive. In recent years, the effect of dissolved organic carbon (DOC) supplied directly from terrestrial and anthropogenic inputs or indirectly as a result of algae blooms, has been shown to cause a metabolic shift in heterotrophic bacteria. This shift is characterized by an increase in metabolic pathways are less efficient but are faster at producing energy molecules ATP and NADH. The shift also stimulates temperate bacteriophage viruses, the natural predators of bacteria, to switch from a lytic to lysogenic lifestyle. Once integrated into the host genome, virus-encoded exotoxins give the bacteria a selective advantage. The exotoxins not only protect the bacteria from predation but are in turn concentrated up the food chain causing disease. Near-shore DOC influx increases the rate of lysogeny on coral reef and is hypothesized to occur on a global scale. This phenomenon may be of particular importance in light of melting permafrost at the poles. The ability to monitor these metabolic shifts is of immediate interest in these threatened and rapidly changing ecosystems.

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All living organisms dissipate energy in the form of heat during respiration. The switch to less efficient metabolic pathways can be observed directly by changes in the amount of heat dissipated by microbial cells using nanocalorimetry. However, to achieve real-time field monitoring of marine microbes the nanocalorimeter must reach nanowatt resolution, within a short time frame and be portable. The design and testing of a nanocalorimeter in directly measuring microbial heat is discussed with future designs for ruggedization for field-monitoring and autonomous deployment.

Nanocalorimetry, in combination with classical molecular techniques, offers highly sensitive, direct, real-time measurements of the dynamic process of microbialization that can be incorporated into models that monitor and pre-empt the outbreak of opportunistic marine pathogens.

390 12:30 pm PP

Drug Combinations to Modify Pancreatic Cancer Stemness

Gregory Burkeen, Cell and Molecular Biology (M)

The average survival for patients with Pancreatic Ductal Adenocarcinoma (PDA) is merely 6 months, underscoring the need for new therapeutic approaches. In addition to mutations in K-Ras, the MYC is reported to be amplified in 20–30% of pancreatic cancer cases. In fact, this amplification is sufficient to initiate cancerous phenotypes in pancreatic cells. Conversely, the tumor suppressor Retinoblastoma becomes repressed during pathogenesis. Together, these alterations contribute to cancer stemness. Simultaneously during PDA progression, pancreatic acinar cells lose activity of the ClassI/II bHLH factors that regulate quiescence. We previously found that restoring transcriptional activity of the Class I bHLH factor E47, in highly aggressive PDA cells, induced stable growth arrest in vitro and in vivo through MYC downregulation and by restoring retinoblastoma (RB) activity. To translate these findings for clinical utility, we developed a high throughput screening platform to identify small molecule inducers of Class I/II bHLH activity. A screen of 4,375 known drugs identified 70 bHLH activators. Statins or (HMG-CoA reductase inhibitors) as a class of drugs, were identified as promising candidates. Pitavastatin was the most salient bHLH activator amongst them. Studies with Pitavastatin in primary patient-derived tumor cells and established PDA lines, revealed dose-dependent growth inhibition. At the molecular level, Pitavastatin induced expression of the cyclin-dependent kinase (CDK) inhibitor p21and blocked repressive phosphorylation of RB protein. Here we show that a second hit from the screen, unrelated to statins, also upregulates p21 and promotes RB activity. Moreover, Drug 2 ablates MYC expression. Together, the drugs act in synergy to induce growth arrest by reducing expression of the S phase genes Aurora Kinase A, CCNB1 and CCNB2. The data establish the effectiveness of a novel drug combination to control PDA cell growth. Future studies are aimed at in vivo testing.

Session C-16

Poster Biological and Agricultural 4

Friday, March 1, 2019, 12:30 pm

Location: Montezuma Hall

391 12:30 pm QQ

Comparative Analysis of Arabidopsis and Boechera Abiotic Stress Tolerance

Ruth Epstein, Biology (U)

Rising levels of carbon dioxide in the atmosphere, caused by the burning of fossil fuels, has altered the earth's climate. This is referred to as global climate change. Global climate change has increased overall temperatures and increased the frequencies of extreme temperature events such as heat waves and drought. At the same time that this is occurring, the human population has continued to increase. This has put strains on agriculture. Most farmers are directly dependent on natural sunlight to nourish their crops. Many agricultural regions have experienced decreases in productivity due to water scarcity and changes in ambient climate. There is a great need to develop crop species that can tolerant both drought and light stress. One method of optimizing crop productivity is to understand the physiological effects both these stressors have on these plants. We have been studying the Boechera genus (Brassicaceae) to help identify novel pathways of plant stress tolerance. We have identified a number of Boechera species that are native to California and that possess high levels of abiotic stress tolerance. Previously we have shown that a population of Boechera depauperata, from a high mountain ridge in the Sierra Nevada, is highly tolerant to high temperature stress. Here we describe the tolerance of B. depauperata to both drought and light stress. We compare the levels of tolerance of B. depauperata to that of Arabidopsis thaliana (a model plant). We have grown B. depauperata for two weeks and then withheld water. In the first trial, light intensity was set to 90 mE. At two-day intervals we have sampled stressed and non-stressed plants and determined the extent of cell death, by ion leakage, in leaves and the activity of Photosystem II (PSII) (a crucial component of photosynthesis), by chlorophyll fluorescence. In the second trial, light intensity was set to 130 mE and data collection was then repeated. This data shows that B. depauperata is more tolerant than A. thaliana to drought stress during low light stress and high light stress.

392 12:30 pm RR

Pigment protein pathways in colorful Habronattus jumping spiders

Karina Silvestre, Biochemistry (U)

Habronattus is a clade of jumping spiders (Salticidae) known for their excellent vision and complex courtships. Adult males have intricate sex-specific ornamentation vital to their sexual

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displays. These color modifications vary from species to species and are prominently visible on the frontal carapace and front legs. The ornamentation and complex courtships have propelled the Habronattus group to become a leading model for different biological systems such as sexual selection and hybridization. Our aim is to identify the genetic basis of sex-specific ornamentation via comparison with Drosophila pigment pathway associated genes. We studied H. festus and H. ophrys transcriptomes for homologous heme, melanin, rhodopsin, ommochrome, and pteridine pathways. Products of these pathways are responsible for the coloration in many invertebrates, with ommochromes being the most significant pigments in spiders. Understanding these pathways will provide additional insight into the differences between the two species, H. festus and H. ophrys, as well as how these differ from other spider groups.

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393 12:30 pm SS

Taxonomy of the Cryptantha clevelandii complex (Boraginaceae)

Claire Abbott, Biology - Evolution and Systematics, Pre-Medicine (U)

Cryptantha clevelandii is a flowering plant species of subtribe Amsinckiinae, family Boraginaceae. This species has been treated with two varieties in recent taxonomic treatments: C. c. var. clevelandii and C. c. var. florosa. Here are presented results of an ongoing morphometric study of the complex, measuring features of stem vestiture, mature calyx (in fruit) orientation, relative gynobase+style length, nutlet number per fruit, and nutlet dimensions. The goal of this research project is to untangle and solidify the taxonomy of the Cryptantha species. It is clear from these studies that Cryptantha clevelandii var. florosa has long been confused with Cryptantha hispidissima, the latter not recognized in most recent treatments. Both taxa tend to have four nutlets per fruit, but the former has spreading and appressed trichomes with a relatively short style extension, and the latter has only spreading trichomes with a relatively long style extension. Boxplot and Anova statistical analyses demonstrate considerable overlap between the two varieties of true Cryptantha clevelandii. However, there is a tendency for Cryptantha c. var. florosa to have a greater fruit angle, a larger number of nutlets per fruit (up to four), and larger corollas. We have observed that a number of specimens of C. clevelandii var. clevelandii have virtually only appressed trichomes, a form that we are tentatively terming “strigillosa”; this form may warrant taxonomic recognition. Two other species of the complex that have been recognized in recent treatments, Cryptantha abramsii and C. brandegeei, are not clearly distinct from C. clevelandii. Cryptantha abramsii, which was described as differing in having flowers bracteate, but really has very scanty, scattered bracts. Cryptantha brandegeei, which was described as being prostrate and also having bracteate flowers is restricted to Santa Rosa and apparently Santa Cruz Islands. It may also be distinctive in being prostrate and might be recognized as a variety of C. clevelandii. Finally, two northern California species restricted to serpentine habitats, C. dissita and C. hispidula, may be most closely related to C. hispidissima and C. clevelandii, respectively. Future molecular phylogenetic studies will be needed to elucidate phylogenetic relationships in the complex.

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394 12:30 pm TT

Programmed Cell Death in Cylindropuntia wolfii (Cactaceae) Development

Hao Duong, Biology (U)

Angiosperms make up roughly 80% of all living plant taxa and their success is mostly attributed to their perfect flowers. However, imperfect flowers have been observed in a few species of angiosperms, these flowers exhibit only one functional sexual organ. Both perfect flower development and imperfect flower development rely highly on programmed cell death (PCD) as a response to environmental factors and developmental cues. These flowers origins, especially functional dioecy, is poorly understood and studied. As a result, it’s common to see many plants were misclassified and their functions and ecological roles were misunderstood. For example, Cylindropuntia wolfii (hereafter C. wolfii) was classified as gynoecious based on the flowers’ superficial observed sexual dimorphism, which is highly subjective. A more objective analysis of C. wolfii will be conducted as an attempt to understand the nature of these flowers. Obtained information could potentially be use to reclassify many members of the Cylindropuntia genus and understand their importance in North American Desert ecology. Histological analysis of flowers’ stamen and ovules will be conducted based on Steven E. Rubin’s Plants Microtechique and Microscopy, 1999. TUNEL assay will be conducted to trace DNA fragmentation of the flower. Cross pollinations will test for functionally of the terminated organs. A germination experiment of collected seed’s viability will be conducted based on Flores-Torres 2012 study of Cylindropuntia leptocaulis. Upon histological analysis, C. wolfii is found to be functionally dioecious. The male flower’s ovules and ovum were physically smaller and shriveled. Upon closer inspection, the megaspore mother cell was arrested during meiosis with collapse of the embryonic sac. In female flowers, the microspore mother cell was completely terminated prior to meiosis upon the completion of mitosis, resulting in undeveloped anthers. Cross pollination further confirmed C. wolfii’s status as functionally dioecious, with male plants producing no viable seeds and the female plant anther’s inability to fertilize another female plant. C. wolfii is dioecious based on molecular and histological analyses of the flowers. The different arrests occurred at different stages of development, suggesting PCD in this species is highly specialized as an attempt to avoid inbreeding depression.

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395 12:30 pm UU

The role of protein kinase c in Hydroides elegans metamorphosis

Milagros Esmerode, Cellular and Molecular Biology (U)

To find a suitable habitat for adult life on the sea floor, the swimming larvae of many marine invertebrates undergo metamorphosis in response to surface-bound bacteria. Although many animals require beneficial bacteria for normal development, the molecular context in which these interactions take place, is not well understood. Hydroides elegans, is a model marine tubeworm which undergoes metamorphosis in response to a bacterial cue. This animal-microbe interaction occurs with the bacteria, Pseudoalteromonas luteoviolacea (P. luteo) which produces a virus-like structures shown to induce metamorphosis and is required to complete the larval-juvenile life-history transition (Shikuma, N. J, et. al., 2014). Although Protein Kinase C (PKC) signaling has previously been hypothesized to start the metamorphic process in tubeworm larvae, no one has previously been able to directly target individual PKC enzymes in order to assess their function. By pioneering RNA interference (RNAi) assays in this model organism, we directly show that matrix metalloproteinases (MMP) and PKC are required for bacterial induction of metamorphosis. Little is known about how microbes interact with their eukaryotic hosts, however, using our one bacterium-one animal model system, we have begun to illuminate the molecular mechanisms of these interactions.

396 12:30 pm VV

Conserved properties of capsids in double stranded DNA viral lineages

Malida Hecht, Physics (U)

Viruses infect organisms in all domains of life and represent a threat for public health. The rapid mutation rate of viruses is a constant challenge for the development of antiviral strategies, and the pool of viral genes is for the most part unknown. The structure of viruses, however, display conserved properties that may represent their Achilles' heel. All viruses build a protein shell called a capsid that protects and stores the infective viral genome. The building blocks of these shells (capsid proteins) adopt a limited number of structural folds, which define viral lineages that include viruses with shared molecular and cellular pathways, despite infecting different hosts that range from bacteria to humans. The biophysical properties of the capsids in each of these lineages, however, remain mostly unexplored. Here, we have studied the capsids of viruses in the two main lineages containing double stranded DNA genomes (group I in the Baltimore classification): the HK97-like and PRD1-like viruses. Cryo-electron microscopy and X-ray reconstructions were measured with UCSF Chimera to extract the internal and external radii, sphericity, volume, surface area, capsid protein exposed areas, genome density, and icosahedral number, among other properties. The analysis unveiled a very strong relationship between capsid size and genome size with the icosahedral capsid number, which was distinctive for each lineage. Additionally, the genome density and capsid protein surface was conserved across capsid sizes, and the values were again distinctive for each lineage. These findings confirm that viral capsids in viral lineages conserve their fundamental structural properties regardless of their viral host. Underpinning the specific molecular mechanisms responsible for this evolutionary constrain would let us one step closer to develop general antiviral strategies for each viral lineage.

Session C-17

Poster Biological and Agricultural 5
Friday, March 1, 2019, 12:30 pm
Location: Montezuma Hall

397 12:30 pm WW

Identification of Core Microbiome and Functional Metabolites of Captive Sharks for Health Matrix Construction

Asha Goodman, Molecular and Cellular Biology (D)

The skin of any aquatic animal serves as the direct interface between the organism and their environment, including available nutrients and abiotic conditions. Shark skin, which is comprised of dermal denticles above a mucus layer, hosts a diverse array of symbiotic microorganisms including bacteria, archaea and viruses. These microbiotas collectively make up the sharks' microbiome and are quantified using metagenomic sequencing technologies. In addition, the small molecules these microorganisms produce are identified via mass spectrometry and used for metabolomic analyses. The coupling of these methods provides robust taxonomic and functional community profiles of shark skin microbiomes.

As overfishing, trawling, and other anthropogenic forces cause shark populations to decline worldwide, conservational efforts aimed at evaluating shark fitness are increasingly necessary. The abundance, community structure, and metabolic functions of shark-skin microbiomes are critical indications of shark health, however, these features of the shark have not been measured. The microbiomes of captive animals are particularly instrumental for the construction of a health matrix as aquarium populations may serve as indices for healthy microbiota community states.

The San Diego Birch Aquarium at Scripps houses several species of Elasmobranches, including leopard (Triakis semifasciata), horn (Heterodontus francisci), and swell (Cephaloscyllium ventriosum) sharks and we began annual veterinary exams in the summer of 2018 to evaluate the health of these specific kelp-tank inhabitants. Preliminary data reports significantly lower observed occurrences of phages, prophages, and transposable elements in captive T. semifasciata shark microbiomes compared to H. francisci and C. ventriosum organisms (p-value < 0.01), suggesting a species-specific outcome from the symbiotic microbiota for captive T. semifasciata sharks. Here I aim to identify a core microbial composition and functional metabolites of the three

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shark species and compare with shark health indicators, such as blood counts, to describe the relationship between microbiome and shark health.

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398 12:30 pm XX

Skin Microbiome Taxonomy and Functional Composition of Whale Sharks (Rhincodon typus)

Abigail Turnlund, Biology (U)

The symbiotic relationship between microbes and their host are important in understanding organismal health and function. However, only a few marine species have had their microbiome examined. The skin microbiome of the thresher sharks was distinctive from the water column, novel, as only 10-30 % of the metagenome match the database, and conserved across individual sharks from the same species. The shark microbiome varied in the level of diversity compared with other marine organisms, suggesting that the sharkskin that is composed of dermal denticles may have a unique way of regulating the microbiome. To further explore the effect of the sharkskin on microbiomes, we will describe the taxonomy and functional composition of the microbial community on the skin of the whale sharks, Rhincodon typus. Whale sharks are the largest fish in the ocean, which occur in tropical waters worldwide. Our research will describe the skin microbiome and whether it changes over time.

The Whale Sharks from La Paz, Mexico were sampled over 2 years. The skin microbiome was collected during free diving using a dual chamber blunt syringe, which flushes the microbes of the surface and simultaneously collected microbial communities from the skin. The microbiome was described using shotgun metagenomics with samples sequenced on the Illumina Miseq. Annotation was conducted using Focus and SuperFocus, and differences between sharks and water identified with Permanova and Simper analysis.

During 2014, four whale sharks were sampled and in 2017, 8 sharks were sampled. The 2014, metagenomes contained 1,008,368 sequences and the 2017 metagenomes contained 1,024,777 sequences. The most abundant microbial taxa at the family level on the whale sharks that are distinct from the water column are Alteromonadacae, Flavobacteriaceae, and Pseudomonoadaceae. The most abundant taxa families found in the surrounding water column are Moraxellacae, Pseudoalteromonadaceae, Halomonadaceae, and Vibrionaceae. In addition, the functions of the whale shark microbiome were distinctive from the surrounding water with an overabundance of sequences similar to membrane transport, regulation and cell signaling, and virulence, disease, and defense. The taxa and functions of the whale shark and thresher shark metagenomes will be compared to identify similarity between their skin microbiomes.

399 12:30 pm YY

Distinct Microstructure of the Dermal Denticles of Three Californian Shark Species

Isabel Moreno, Biology (U)

Dermal denticles are features of the shark skin, which provides rigidity, protection and hydrodynamic properties for each shark species. Like mammalian teeth, denticles consist of an inner core of connective tissues, blood vessels, and nerves that are covered by dentine and vitrodentine. Denticle structure is unique to individual species and reduces drag during swim. The size, placement and grooves of dermal denticles are key to drag reduction and increased hydrodynamic flow of the shark through the water. The presence of surface microbes or the invasion of microbes into the denticles may disrupt the structural features and affect the hydrodynamic flow, increasing drag. The effects of microbes on denticle surfaces is an unexplored area of investigation. Therefore, we will describe the dermal denticles and microbial load of three local Californian species of sharks. We hypothesize that bacterial presence on shark dermal denticles is more frequent in sharks exhibiting larger amounts of biomaterial such as surface tissue debrison their dermal denticles than those without. Shark skin biopsies were sampled from 4 leopard, 4 horn and 11 swell sharks from the Birch Aquarium. The swell and horn sharks are sedentary, whereas the Leopard shark is a more slower swimming shark and these differences in motility may affect the bacterial load. The denticle structure was described using scanning electron microscopy (SEM). Our results show that each species has a different denticle structure. The horn shark has cross-shaped denticles, which are sparsely populated across the skin surface. The swell shark has overlapping spade-shape structure, with sharpened edges. The leopard shark denticles appear more broad, rigid, and overlapping, although similar in shape to the swell shark. When comparing the three species, there were different amounts of bacteria present on the surface of the denticles. In our analysis, the horn shark had the least amount of surface bacteria present. More biomatter and bacterial load was evident on leopard shark denticles when compared to the other two tank raised species. These are the first observations of the skin surface on swell and horn sharks and we found that the higher motility sharks have a higher bacterial load.

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400 12:30 pm ZZ

A Metagenomic Look at the North City Water Reclamation Plant

María Fernanda Mora, Biology (U)

San Diego's dependence on imported water has increased dramatically over the years. Currently, 85% of San Diego's water supply is imported at a cost which has tripled in the last fifteen years. In efforts to reduce such dependence, wastewater at the North City Reclamation Plant (NCWRP) is treated in order to produce reclaimed water that can be used for non-potable purposes and then treated at the North City Pure Water Facility to produce safe drinking water. A

concern of the process is the types of microbes that may remain in the potable water. Here, we used metagenomics, the study of the genome of all the microorganisms present in an environmental sample using next-generation sequencing to describe the microbial communities present after each step in the treatment process. To do this, approximately 70-100 L of water from several of the steps in the treatment were collected. Each water sample was concentrated using tangential flow filtration and the microbial cells were collected using 0.2-µm Sterivex filters. The samples were prepared for DNA extractions and sequenced using the Illumina MiSeq. Upon sequencing, the raw data was checked for quality control and using bioinformatics software, we were able to look at the organisms present in our samples. The data showed there was a substantial difference among the microbial communities in each of the treatment steps. For instance, before treating the wastewater, Vibrio furnissii, a pathogen causing acute gastroenteritis, and Vibrio cholerae, a pathogen causing cholera, were present. After treatment, they were no longer present and the microorganisms that were present, such as Acetobacter pasteurianus, which is commonly used in fermented foods, were not harmful to humans. Thus showing that while there are still microorganisms present after treatment, they are not necessarily harmful to humans.

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401 12:30 pm AAA

Biological Survey of Chondrichthyes in La Jolla Shores, California Using Environmental DNA

Anissa Busch, Environmental Sciences (U)

Marine predators such as sharks, (Class: Chrondrichthyes) are important top-down regulation of the oceanic ecosystems. Sharks are one of the most data deficient species groups, with minimal information on distribution, and population size for around 46% of the species. Therefore, conservation and management of sharks is difficult, and sharks are now the most threatened species. Recently, there have been an increase in shark attacks in San Diego, resulting in increased public safety concerns. Monitoring of the presence of sharks could help understand the species distributions for conservation and management of these species and provide precautionary measures to prevent human-wildlife interactions. Traditional biological surveys have been conducted on SCUBA or using research fishing to describe numbers and distribution of marine species. Environmental DNA (eDNA) monitoring is emerging as an important tool for biodiversity surveys. eDNA consists of collecting seawater samples that have tissues, cells or extracellular DNA that can be analyzed to provide a description of the organisms that have recently moved through the location. Species richness of sharks and relative abundance is described through analyzing the DNA in the seawater samples. eDNA uses specific metabarcoding for each marine group to obtain information about the target group of organisms.

The goal of my study is to optimize shark specific primers for eDNA and conduct monthly surveys of sharks in La Jolla Shores. Research sampling will take place in the months February, March and April of 2019 to assess monthly variability among the species distributions. The monthly variability will allow an assessment of Chondrichthyes habitat preference during specific months. In February 2019, I will be obtaining my preliminary results by collecting seawater samples for my data. Using eDNA from water samples to take biological surveys in La Shores will identify occurrence of apex predators and can notify the public of their presence. I hope to provide more exposure to using eDNA metabarcoding as a biological survey. Collecting water samples and analyzing their eDNA is a non-invasive technique. This technique will provide a better understanding of the biodiversity of Chonrichthyan presence in La Jolla Shores and could ultimately protect these species.

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402 12:30 pm BBB

Scanning Electron Imaging of Daple Mutant Zebrafish Ependymal Cells

Veronica Vazquez, Biology (U)

Cerebrospinal fluid (CSF) fills the ventricles of the brain which are lined with ependymal cells (EC) that have apical surfaces covered in cilia. The cilia are known to circulate the CSF. A loss of EC cilia function leads an accumulation of CSF that enlarges the ventricles of the brain resulting in hydrocephalus. A mutation in Daple protein has been shown to cause hydrocephalus in humans and mice.

To investigate the morphological consequences of a similar Daple mutation in genetically modified zebrafish (Danio rerio), scanning electron microscopy (SEM) is used to visualize zebrafish EC and associated cilia. Homozygous Daple knockout embryos were created using CRISPR/Cas9 and inserting of ΔINS13BP, adults were then bred to create the mutated line. It is hypothesized that wild type fish (+/+) will have normal polarized cilia and no signs of hydrocephaly, heterozygous Daple mutants (+/-) will not show a difference from WT since it's a recessive mutation, and homozygous Daple mutant fish (-/-) will have a lack of polarized cilia, deformities in cilia, as well as a possible lack of cilia resulting in hydrocephalus phenotypes. To prepare specimens for SEM analysis, fish were anesthetized and dissected for fixation. The brains were sectioned, osmicated, dehydrated, then coated with 6 nm platinum for SEM imaging. Initial observations show WT zebrafish display no physical signs of hydrocephaly before dissection. By SEM analysis, WT cilia display a flowing polarized patterning. Heterozygous Daple mutants (+/-) do not display hydrocephaly before dissection. Upon SEM imaging, the cilia have a flowing polarized patterning. Homozygous Daple mutant zebrafish (-/-) are observed to display distinct hydrocephaly prior to dissection, with enlarged ventricles protruding from the cortical surface. Upon SEM imaging the cilia are difficult to locate in areas where normal cilia reside and the little that is observed lacks any consistent patterning. These observations suggest that Daple plays a critical role in the development and/or maintenance of ventricular EM cilia.

This experiment is a collaboration with Jason Ear from Dr. Pradipta Ghosh Lab at UCSD in the Department(s) of Medicine and Cellular and Molecular Medicine and Dr. Ingrid Niesman from SDSU's EM-Imaging Facility.

SRS

Abstracts of Presentations

Session D

SAN DIEGO STATE UNIVERSITY

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

Session D-1

Oral Physical and Mathematical Sciences 9
Friday, March 1, 2019, 3:00 pm
Location: Pride Suite

403 3:00 pm

Characterizing 2C10: an anti-double stranded DNA antibody

Citlayi Villaseñor, Chemistry - Emphasis in Biochemistry (U)

Mammalian immune systems employ proteins called antibodies that target and counteract the effects of harmful pathogens. The 2C10 antibody, which was isolated from mice that exhibited Lupus-like symptoms, binds double-stranded DNA (dsDNA) as its antigen. Due to its sequence similarity with a well characterized metalloantibody, we hypothesize that dsDNA binding by 2C10 is a consequence of it being a divalent metal ion binding metalloantibody. We employed the Bac-to-Bac baculovirus-encoded recombinant protein expression system to produce 2C10 Fab fragments from Spodoptera frugiperda (Sf9) insect cells. Both open reading frames of the antibody heavy and light chains are contained within one pFastBacDual shuttle plasmid. Both chains contain N-terminal secretion signals and the heavy chain possesses a histidine-tag at its C-terminus for affinity purification. Upon transformation of the 2C10 shuttle plasmid into DH10Bac Escherichia coli, recombinant bacmid DNA containing the antibody sequences plus the genes encoding for a mature insect baculovirus formed via recombination. Sf9 insect cells were transfected with bacmid DNA to produce intact, recombinant baculovirus. Western blot confirmed expression of 2C10, however, the recombinant 2C10 remained trapped within the insect cells. Sequencing of the 2C10 plasmid revealed that one amino acid residue was missing. We introduced the missing arginine by mutagenesis. This resulted in successful secretion of the antibody Fab. These results suggest that the baculovirus/Sf9 system is well suited for production of recombinant antibody fragments. We are currently optimizing antibody Fab expression levels in Sf9 cell suspensions. The heavy and light chains of 2C10 were visualized on SDS-PAGE in the first purification, however, in following purifications only one chain appears. Once antibody Fab expression is optimized, we aim to apply gel mobility shift assays as well as x-ray crystallography to study the antibody-DNA complex to determine its binding mode. This project has been supported by a grant from the National Institute of General Medical Sciences of the National Institutes of Health: SDSU MARC U*STAR 5T34GM008303-29 as well as CSUPERB and the Doris A. Howell Foundation.

404 3:15 pm

Ba/F3 Cells in the Evaluation of a Novel Targeted Treatment Against the EGFR T790M Resistance Mutation in NSCLC Patients

Bryan Argueta, Chemistry (M)

This proposal aims to assess the ability of a chiral inhibitor developed in the Gustafson lab in impeding unregulated cellular growth in Ba/F3 cells expressing the activating mutation L858R, in the epidermal growth factor receptor (EGFR). This mutation is commonly found amongst patients who develop resistance to EGFR tyrosine kinase inhibitor (TKI) therapy. In assessing the genomes of those who developed resistance, the most commonly found mutation (T790M) prevents traditional drug targets from binding in the kinase domain of an expressed constitutively active EGFR gene, as occurs in patients with non-small cell lung cancer (NSCLC). We will focus on the L858R activating mutation, although several deletions in exon 19 of the EGFR gene have also shown to induce ligand-independent activation of EGFR, and thus increased cellular proliferation.

Ba/F3 cells were originally cultured from murine bone marrow, and are characterized as pro-B lymphocytes. They grow rapidly, and do not need to be trypsinized, as they grow in suspension. IL-3 independence suggests that a pathway downstream of IL-3 signaling has become activated in transformed cells. Ba/F3 transformation assays contain 5 steps: Infection, Expansion, Selection, Washing, and Monitoring. In this assay, we will generate 4 transformants via retroviral transfection, using Addgene plasmids: a control line containing the empty vector backbone, a wild type (EGFR WT), a mutant containing the activating mutation (EGFR L858R), and a dual L858R/T790M resistant strain. All plasmids are sent as bacterial agar stabs, and will be cultured for amplification using ampicillin as the selection marker. Furthermore, each transgene will be transfected along with a puromycin resistance gene, which will serve as a selectable marker for recombinant Ba/F3 cells. The viruses are replication deficient, and to facilitate retroviral transfection, a plasmid containing the major proteins needed for pCL retroviruses (gag/pol/env) will be co-transfected along with each of the afformentioned plasmids.

After infection, the cultures will be expanded for 48 hr in media composed of the following: 90% RPMI 1640, 10% heat inactivated (h.i.) FBS, and 10 ng/ml mouse IL-3. Selection will be done with puromycin treatment for 7-10 days. The cells will then be washed in IL-3 free media (2-3X).

405 3:30 pm

Regioselective Halegonation of Phenol: Mechanistic Insights and Kinetic Studies of Lewis Base catalysts

Andrew Dinh, Chemistry (D)

Aryl chlorides are numerous in a wide variety of small molecules, especially prevalent in pharmaceuticals as synthetic handles for late-stage functionalization and for improvement in bioavailability. As such, there is a comprehensive library of methodologies to access aryl chlorides, with electrophilic

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aromatic substitution (SEAr) in the forefront. However, one of the main shortcomings of SEAr is the innate electronic properties of the substrate leading to a mixture of undesired regioisomers, as well as limited substrate scope and harsh reaction conditions. Therefore, it becomes a synthetic challenge to access the less favored regioisomers when the substrate has a strong activating electronic preference.

In 2015, we disclosed that sulfur-derived Lewis bases such as triphenylphosphine sulfide can catalyze the chlorination of arenes and heterocycles under mild conditions through activation of N-chlorosuccinimide. One of the shortcomings was that it did not address the issue of regioselectivity. Hence in 2016, we developed a regiocontrolled EAS chlorination and bromination of phenols, which highlighted various Lewis Base catalysts that could reverse or enhance the innate regioselective nature of the phenol. Despite these results, we found limitations in reactivity and substrate scope.

To solve these problems, we embarked on mechanistic studies to better understand how our Lewis base catalysts function. Our initial in silico findings predicted our catalyst can interact with the chlorine atom through a halenium adduct, implying that catalyst structure can control regioselectivity. Additionally, monitoring reactions via nuclear magnetic resonance (NMR) spectroscopy revealed the formation of unique catalytic byproducts for both triphenylphosphine and Nagasawa's bis-thiourea in the presence of N-chlorosuccinimide, which can heavily impact the rate and regioselectivity of SEAr halogenation. Based on these results, we then developed new catalysts that could enhance the initial rate of reaction while imparting comparable regioselective control on phenol without degradation over time.

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406 3:45 pm

Synthesis of Novel Methylsulfoximine Small Molecule Derivatives Active against the Hepatitis C Virus

Kevin Walsworth, Chemistry (D)

Background and Significance: Approximately 3.2 million people in the United States are currently living with hepatitis C virus (HCV). As a positive-sense RNA virus, HCV is prone to mutations, which makes it difficult to design drugs that can target either the viral proteins or the genome itself. It has been discovered that a small section of the 5' non-coding region of the RNA, called the internal ribosome entry site (IRES) acts as a molecular switch. The IRES recruits human ribosomes to bind, which causes a conformational change in the IRES, and allows for the ribosome to translate the RNA into viral proteins. Notably, this small section of RNA is highly conserved, as previously discovered HCV showed only two point mutations in the IRES. Due to this high degree of conservation, the IRES is an invaluable target for drug design that mimics the natural ligand and forces the IRES into a conformation that will not recruit ribosomes, rendering the virus unable to reproduce.

Methods: We have created an improved, efficient synthesis of diverse methylsulfoximine molecules using novel techniques developed in our laboratory. We have initiated synthesizing new analogs designed to improve affinity of the targets for the HCV RNA. We plan to conduct rapid assays of the new compounds against the IRES-IIa subdomain, allowing us to iteratively refine SAR and leverage our new synthetic route toward obtaining compounds with increased potency.

Results: It has been shown that precise shape complementarity based solely on hydrophobic interactions can significantly improve ligand binding even in hydrophilic target sites such as RNA. We have focused on synthesizing heterocyclic methylsulfoximine derivatives of the natural HCV IRES ligand that will take advantage of these space-filling interactions. The initial scaffold has been synthesized and tested on the RNA construct. We are currently working on modifying the scaffold to be more like the native ligand to further improve binding to the IRES.

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407 4:00 pm

Developing Atroposelective Syntheses to Access Pharmaceutically Relevant Compounds

Mariel Cardenas, Chemistry (D)

Atropisomerism is becoming increasingly important in synthesizing more potent and selective pharmaceuticals. One long-standing challenge is the reliance on semi-preparative HPLC on chiral stationary phase. Though appropriate for early-stage medicinal chemistry, it becomes inefficient as it is time consuming, limits the scalability, and is resource/cost-intensive. Herein we report a general atroposelective strategy to obtain pharmaceutically relevant pyrrolopyrimidines (a common kinase-inhibiting scaffold), pyridines and quinolines (which are among the most common moieties in FDA-approved drugs). Through enantioselective nucleophilic aromatic substitution with thiophenol, we can synthesize a diverse range of heterocyclic, pharmaceutically relevant scaffolds in high atroposelectivity. We show the resulting enantioenriched sulfide products can be converted to a sulfone and subjected to a second nucleophilic aromatic substitution with any nucleophile (with no observed racemization). Importantly, we are able to expand our atroposelective nucleophilic aromatic substitution strategy to access enantioenriched small-molecules with known biological activities. We have observed higher relative selectivity and potency through implementing our synthetic strategy of designing more stable atropisomeric compounds.

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408 4:15 pm

Discovery and Improvement of a Potent Nucleoside Analogue Produg Which Inhibits the RNA Dependent RNA-Polymerase of the Zika Virus

Michael Coste, Organic Chemistry (D)

Between 2015 and 2016 there was a pandemic outbreak of the Zika Virus (ZIKV) in South and Central America that affected thousands of people. Although the Zika Virus usually presents itself with mild, flu-like symptoms, it can in rare cases develop into microcephaly in pregnant woman, which causes a reduction in the cranial development of an infant and can cause Guillan-Barré syndrome in adults, which is an autoimmune disorder that can lead to permanent physical paralysis. Souza

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et al. tested the drug Sofosbuvir, a clinically approved HCV treatment, on the Zika Virus since HCV and Zika both share the RNA dependent RNA polymerase (RdRP) that Sofosbuvir inhibits. As the RdRP is not fully conserved between the Zika Virus and HCV, it was found that Sofosbuvir was not potent enough to fully inhibit the RdRp of the Zika Virus. There is still a need for an effective treatment of ZIKV. Our labhas successfully synthesized the compound 2′-C-methyluridine (2′-C-MeU) prodrug, which we have shown, in collaboration with the Siqueira-Neto group at UCSD, to be 5 times more potent in cell-based assays than Sofosbuvir. The 2′-C-MeU prodrug utilizes a chain termination inhibitory mechanism and a prodrug approach to inhibit ZIKV with an EC50=1.59 μM, as compared to Sofosbuvir at EC50=6.32 μM. We are currently in the process of improving the potency of 2′-C-MeU prodrug by modifying the 2' ribose position with different functional groups to utilize the available space we discovered while doing molecular homology modeling of the ZIKV RdRP. We also think we can increase potency by independently modifying the prodrug functional group, then combining our best result with the best 2′ ribose modification to generate the most potent nucleoside analogue prodrug to treat ZIKV. We have currently synthesized a variety of 2′ ribose modified nucleoside analogue prodrugs and a new series of prodrug modified nucleoside analogues which we are currently testing in cell based assays.

Session D-2

Oral Visual and Performing Arts 1
Friday, March 1, 2019, 3:00 pm
Location: Park Boulevard

409 3:00 pm

The Challenges of the Female Director

Lauren Haughton Gillis, MFA Musical Theatre (M)

There is a gender gap in Broadway theatre direction. In the current 2018 Broadway season and upcoming 2019 season, out of fifty-five shows, only eight of them have female directors. That is only fourteen percent. While this is a hot-button issue that is getting a lot of press right now, the numbers reflect not much improvement from the late 1990s and early 2000s. Also, there are limited number of books and scholarly texts that are current on this issue. I enjoyed the content of the dissertation: Dancing Up the Broken Ladder,and the books: Women in American Musical Theatre,American Women Stage Directors of the Twentieth Century, and Forgotten Leading Ladies of the American Theatre,but all of these texts were published ten to thirty years ago. Therefore, I chose to interview women who are currently in the field to get real information about their experience first-hand, right now. I found that there is a gender gap in Broadway direction because of these four challenges: women need to be legitimized by important men before they can even be let in the door, women are not often trusted with the big business of Broadway, the struggle some people have with female gender in power positions, and the fact that women are often juggling personal relationships, children and family on top of work. I want to offer a solution on how current successful, accomplished female directors can help women pursuing direction and how the theatre community as a whole can support, foster, and encourage female directors.

410 3:15 pm

Polishing the Lost Gems of Musical Theatre

Trist Fishman, Musical Theatre (M)

Whenever we are asked to sit in the audition room to observe and adjudicate, something extremely irritating happens, we hear the same stagnant group of songs. The catalogue of audition pieces, especially for teenagers, is limited in content. There is more to the world of Musical Theatre than Wicked, The Phantom of the Opera, Les Miserables, and Rent. I would like to attribute this to the force of “mainstream” theatre on the audition process. A popular show does not equal strong audition material. My book, Musical Theatre Gems No One Has Ever Heard will help fill this void by providing fresh material to young musical theatre artists, and also educating them in chunks of musical theatre history that may have fallen by the wayside. I have gathered show titles and background information from The Musicals No One Came to See by Rick Simas, Not Since Carrie by Ken Mandelbaum, A Chronology of American Musical Theater by Richard Norton, Second Act Trouble by Steven Suskin and various manuscripts of scores from forgotten musicals. The purpose of this project is to rehabilitate musicals produced between 1979 and 1989 that have been labeled as “flops,” by, first, discovering the extra-theatrical circumstances that caused a show to fail, and second, discuss the value of certain songs included in the work. In doing so I will compile a song book that argues that these shows deserve a stronger representation in the musical theatre canon, and provide relief from over sung audition pieces. In conclusion, by continuing my research with the help of Mr. Simas' and Mr. Mandelbaum's texts I will continue to bring variety in the audition room.

411 3:30 pm

We're All in This Together: The High School Musical Director's Guide to Building a Creative Team

Devon Hunt, Musical Theatre (M)

The arts are slowly being boxed out of the American high school curriculum, and musical theatre is often one of the first to go due to its immense complexity and the lack of formal training among teachers. While there are a number of resources available on producing musical theatre at the amateur level, much of the literature focusing on musical theatre in an educational context is in the form of theses and dissertations locked behind academic journal paywalls. In addition, technology in theatre has advanced by leaps and bounds and many of the available books, written in the 60s and 70s, lack any information on this area of theatre production. This paper is a small part of a larger project to create an updated guide to musical theatre production in the high school, focusing specifically on the importance of building a strong creative team. It will draw from both academic writings and commercial-

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ly-published resources, focusing primarily on two dissertations: The Musical Theatre Production: A Guide For The High School Director by James C. Fields (1970) and Musical Theatre In High School by Linda Janicki (1982). As the final work will be primarily intended for educators with little experience producing musical theatre, this paper brings to bear from the literature relevant explanations of the various positions in the creative team and their responsibilities. It argues that the single most important step in producing the high school musical—one that should be taken before a show is ever selected—is choosing a strong creative team, and provides recommendations as to who on a typical school staff can fill each role. A strong creative team divides the massive workload of musical production and provides the high school musical director with expert input regarding show choice. This will lay the foundation for a successful show, creating momentum to develop a long-lasting, profitable musical theatre program that will prove its worth and reclaim its place in the high school curriculum.

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412 3:45 pm

The Choreographer Directs: Storytelling in Contemporary Dance

Eden Hildebrand, Theatre Arts; Musical Theatre (M)

The Choreographer Directs: Storytelling in Contemporary Dance

Theatre has the capacity to shed light on all types of issues (political, environmental, emotional, humanitarian etc.) because the artists who create it have stories they need to tell; a desire to evoke conversation and inspire change.The reason theatre is such a successfully influential genre is because audiences are taken on a journey where they are introduced to characters with whom they can connect and sympathize with. Audiences become invested in these characters' relationships, discoveries, experiences, growth, etc. and in turn, develop a deep empathy for them. Contemporary dance has the same potential to ignite conversation and influence its audiences, however this genre has developed a reputation of being confusing and too abstract to follow. The reason for this is that choreographers often lack training in storytelling. The art of storytelling is not covered in (most) contemporary dance training programs and the relevant literature, specifically pertaining to contemporary dance, is lacking. To remedy this I have developed a methodology comprised of musical theatre, theatre, and physical theatre directing techniques that can be directly applied to contemporary dance. My process includes replicating uniquely chosen aspects of the director's method in: pre-rehearsal preparation and concept development, creation of the material, and rehearsal process.By approaching contemporary dance choreography through the lens of a theatrical director the choreographer is able to elevate their work and produce a cohesive theatrical piece that is driven by character and story. The voice of a dancer rings loudest through movement, and this methodology will help choreographers speak as clearly and passionately as possible.

413 4:00 pm

Change Come Fast and Change Come Slow: "Caroline, Or Change" Presents the Anti-Mammy

James Morrison, Musical Theatre (M)

In the Confederate South of pre-Civil War America, it was common for female slaves to help raise the white children of their owners. These women were known as "mammies." The Mammy became a common archetypal character featured throughout popular culture, beginning in the Reconstruction era and continuing well into the twentieth century. Mammies were consistently portrayed as good-natured and notably happy to put the needs of their white employers above their own. However, the Mammy as we know her is a revisionist myth that conceals the reality of slavery by portraying African-Americans as content in their servitude.

In 2004, an original musical debuted on Broadway that tells the story of Caroline, an African-American maid who works for a Jewish-American family in 1963 Louisiana. But Caroline, or Change, written by Tony Kushner and Jeanine Tesori, does not present its central protagonist as another Mammy. Caroline is not happy in her job. She does not smile at her employers, nor does she want to be a maternal figure to her employer's eight-year old son. Caroline is unhappy with her place in life, and has suffered great personal loss. And because she is unable to move on from her grief, she has emotionally separated herself from the world around her, appearing outwardly as stoic, angry, and bitter. By constantly showing us Caroline's active inner life, as well as her unconventional relationship with both her employer and her employers' child, Kushner and Tesori have created the anti-Mammy.

Utilizing the musical's score and libretto,its highly original combination of storytelling conceits, and the research of other theatrical academics, I will illustrate how Caroline, or Changedeliberately subverts the Mammy archetype. In the character of Caroline we see an entire class of Americans who have always been underrepresented both politically and artistically. Kushner and Tesori have given us a long overdue story of socioeconomic politics, one that in its realism and complexity, has been heretofore unseen on the Broadway stage.

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414 4:15 pm

Unfair, Inaccurate, or Just Plain Mean? An analysis of the representation of Christians in the arts

Shayne Mims, MFA in Musical Theatre (M)

Christians can be terrible people. That is a sad reality as seen on film and television today. My research originally set out to understand how God was being represented in the arts. I began reading plays, as well as, watching movies and television shows and discovered something very uncanny. I uncovered two pivotal issues: Initially, there is a serious lack of appearance of a Christian character on film and secondly, when these characters do appear, they are given a false and negative stereotype which results in a very misunderstood representation. Through my extensive research, I discovered that there have been multiple case studies on frequency and appearance of Christian

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characters. While incorporating my own viewing of television shows and films (both past and current), It became clear to me that this phenomenon appears to be consistent. While there are a great deal of people who are commenting about this phenomenon, there seems to be no one offering any solutions. I intend to raise awareness and propose, that when these writers are creating, they look back at the basic foundational principles that Christianity is based upon. This will lead to a more balanced and proper representation of Christians in the arts.

Session D-3

Oral Health and Nutrition and Clinical Sciences 5
Friday, March 1, 2019, 3:00 pm
Location: Tehuanco

415 3:00 pm

A Gap in Access to Care: The Absence of Culturally and Linguistically Appropriate Services Burdens Limited-English Patients

Melissa Ruiz, Public Health (U)

BACKGROUND:

Hospital readmission rates give insight into a hospital's ability to effectively meet their patient's medical needs, administer medical resources, and tailor care to different ethnic and racial backgrounds. A factor to examine when determining if proper medical care is being provided is having language services for non-English speaking patients in hospitals. This study aims to compare the readmission rates of hospitals with and without language services for patients.

METHODS:

Hospital-level data from the American Hospital Association and data from the surveys: Cultural Competency Assessment Tools for Hospitals (CCATH) and the Florida Hospital Language Services Study (FHLSS), which were fielded at hospitals in California and Florida, were integrated. Different factors were considered including hospital characteristics and services offered to unique patient demographics. These were compared to data obtained for hospital level 30-day all cause readmissions from the Centers for Medicare and Medicaid Services (CMS) for CA and FL for 2015.

RESULTS:

The majority of hospitals had Spanish, Chinese, and Creole interpreters, collected language data, provided translated materials, posted translated signs, and considered cultural and language needs during discharge planning. The average readmission rate across CA and FL hospitals is 15.54. The only service that appeared to significantly impact readmission rates was whether or not hospitals considered cultural and language needs during discharge planning. Readmission rates were lowest when at least half of department considered these needs, this persisted when any department considered them, and highest when none considered these needs (p=.051).

DISCUSSION:

A lack of hospital language services and culturally competent care may cause minority patients to deal with medical burdens that may result in another hospital visit. Thus, broadening the gap in having reliable medical access. It is necessary to further examine hospital discharge planning instructions against hospital discharge rates with higher hospital response rates. The significance of considering cultural and language needs when planning discharge instructions could influence how often non-English speaking hospital patients finalize treatment, transfer to another institution or die after an episode of care.

416 3:15 pm

Effect of holiday season on energy balance and weight gain

Nicole Wells, Exercise Physiology, Nutritional Sciences (M)

The holiday season (November to January) alone, contributes to over half of the annual weight gain in adults. Although self-reported data indicates that this weight gain could be explained by either increased energy intake or decreased physical activity, objective techniques have never been used and thus the actual cause of holiday weight gain is controversial. This study aims to establish relative contributions of decreased energy expenditure and increased energy intake on weight gain during the holiday season. We used validated objective measures, including doubly labeled water for total energy expenditure measurement and total body water for body composition measurement, to isolate the reason for energy imbalance during the pre-holiday (September to mid-November, 55 days) and holiday period (mid-November to early January, 57 days). Blood levels of appetite hormones were analyzed and subjective appetite levels were measured during the two time points. In 23 overweight adults, the body weight change during holiday period (0.41 ± 0.42 kg, mean ± SE) was significantly higher (p=0.02) than the body weight change within the pre-holiday period (-0.86 kg ± 0.42 kg, mean ± SE). The total energy expenditure (-3 ± 54 kcal/d) and total body fat (24 ± 33 %, p=0.95) did not differ during the pre-holiday and holiday period. Using the energy balance equation, calculated energy intake increased significantly by 78 ± 1 kcal/day (p=0.02) between the pre-holiday and holiday period. Compared to the pre-holiday period, during the holiday period participants reported to have higher hunger level (3.93 ± 0.46 cm vs 4.9 ± 0.34 cm, p=0.04) and lower satisfaction level (4.52 ± 0.53 vs 3.5 ± 0.28, p=0.02) immediately after a meal preload. We did not find any differences in appetite hormone levels between the two periods. Our results show that an increase in energy intake, as well as appetite levels, are major contributors to the excess weight gain during the holiday period. These findings are critical in informing development of targeted interventions focused on excessive energy intake during the holiday season.

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417 3:30 pm

Sex Differences and the Apolipoprotein E4 allele in Olfactory Recognition Memory: An fMRI Study

Eleni Kapoulea, Psychology (M)

Background: The Apolipoprotein (ApoE) e4 allele is the strongest known genetic risk factor for Alzheimer's disease. Neuronal areas responsible for memory processing are also associated with odor functioning. To our knowledge, no previous study has examined sex differences in olfactory memory processing utilizing neuroimaging data within elderly, non-demented ApoE e4 non-carriers and carriers. The present study investigates olfactory memory task performance while participants completed an olfactory memory task during a functional magnetic resonance imaging (fMRI) and structural scan.

Method: Participants were (N = 39) non-demented older adults, ranging in age from 64 to 88 years. Individuals with at least one e4 allele were classified as e4 carriers (n = 18) and individuals without the e4 allele (n = 21) were classified as non-carriers. Prior to the fMRI scan, participants were presented with 16 odors from the California Odor Learning Test (COLT). During the scan, participants were presented with labels of odors and asked to decide if the label was presented prior to the scan (target) or not (foil).

Result: e4 carriers demonstrated significantly ($p < .05$) greater atrophy in the left cingulate when compared to e4 carriers. Regression analyses revealed that for e4 carriers, average hit rates were positively associated with cingulate cortex thickness. These associations were not significant ($p > .05$) for e4 non-carriers. While correctly identifying a target, ApoE e4 carriers demonstrated significantly ($p < .015$) greater activation in the right parahippocampal gyrus, right hippocampus, and precuneus when compared to female ApoE e4 carriers.

Conclusion: Results suggest different structural and functional changes in relation to ApoE e4 status that may influence olfactory memory. Further, greater functional activation within male e4 carriers when compared to female e4 carriers suggests that male e4 carriers require a greater cognitive expenditure in areas crucial to episodic memory retrieval when making a correct decision. Greater cognitive expenditure suggests less efficiency in neuronal processing and could indicate cognitive decline. Future studies may consider utilizing this paradigm within a longitudinal study to examine neuronal changes over time.

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418 3:45 pm

Eccentric Hip Rotation Strength in Healthy Adults

Lukas Krumpl, Applied Movement Science (M)

Hypothesis: Hip strength deficits have been shown to contribute to increased knee valgus and hip internal rotation. Research investigating hip external rotation strength has primarily utilized hand-held dynamometry with isometric strength assessment or concentric isokinetic testing. However, eccentric action of the hip musculature is thought to be important in controlling undesired hip rotation associated with various lower extremity injuries. The purpose of this study was to assess test-retest reliability of isokinetic eccentric hip internal and external rotation strength in healthy young adults.

METHODS: Thirty-four healthy individuals (23 yrs (± 4.9), 1.72 m (± 0.1), 73.3 kg (± 14.8)) participated in the study. Participants completed two isokinetic strength tests. The first test session also included completion of the Marx activity questionnaire, height and bodyweight measurements, and a determination of their dominant lower extremity. A 5-minute warm-up on a stationary bike was followed by isokinetic testing. Participants were positioned prone with the knee 90° flexed and the ankle strapped to the dynamometer extension. Eccentric hip internal (IR) and external (ER) rotation strength were assessed through a range of motion from 20° IR to 20° ER at speeds of 60° and 180° per second. Five warm-up repetitions were performed followed by 10 maximal effort repetitions for each test speed. Hip testing order (left vs right) was randomized and reversed at the second session.

RESULTS: ICCs for eccentric hip IR and ER peak torque (PT) and total work (TW) were excellent ranging from 0.91 to 0.96. No significant differences were found in eccentric hip IR/ER PT ($p=0.22$-0.98) and TW ($p=0.07$-0.64) between the dominant and non-dominant limbs. Marx activity scores ranged from zero to 16 (mean 6.9) and Pearson correlation coefficients indicated a fair relationship to all measurements of eccentric IR/ER PT($r = 0.33 - 0.45$) and TW ($r = 0.32 - 0.47$)

CONCLUSION: Eccentric isokinetic dynamometry assessment of hip rotation strength (PT & TW) at 60 and 180° per second is highly reliable in healthy adults. Eccentric isokinetic assessment of hip IR and ER strength may serve as a valuable adjunct in the thorough assessment of lower extremity strength.

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419 4:00 pm

"Endure" and "Excuse": A Mixed-Methods Effort to Capture Disclosure of Intimate Partner Violence among HIV+ Women in Uganda

Brittnie Bloom, Public Health (D)

Worldwide, intimate partner violence (IPV) and HIV remain significant health challenges. Experiencing IPV is classified as a pattern of assaultive and coercive behaviors in current and/or former intimate relationships that are typically defined as emotional, physical and/or sexual assault. IPV has been shown to increase one's risk of contracting HIV and is linked to other negative health outcomes including higher rates of substance use, depression, sexually transmitted infections and death. Global estimates by the World Health Organization indicate that 35% of women experience IPV in their lifetime; however, few women disclose their experiences of violence to others. There is a paucity of research focused on how women disclose their experiences of violence or what happens after disclosure. Increasing our understanding of how culture can influence a woman's experiences of violence and with who and how they share such experiences are needed to focus intervention and education strategies. Such strategies could promote help- and resource-seeking behaviors, ultimately improving health outcomes of those affected by both IPV and HIV (e.g., ART adherence, STI risk). In a mixed-methods study conducted between June and July 2018 in Tororo District, Uganda, 168

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HIV+ women participated in an interview-administered survey; fourteen women self-identifying as having experienced IPV participated in qualitative interviews. This paper will examine IPV prevalence among HIV+ women and their subsequent experiences of disclosure, while exploring how African culture may facilitate negative health outcomes related to disclosure of violence among HIV+ Ugandan women.

420 4:15 pm

Prevalence and correlates of HIV-status knowledge among men aged 15 – 59 years in rural central Uganda - Implications for HIV/AIDS response

Michael Ediau, Public Health (Global Health) (D)

Background

In Uganda, up to 1,300,000 people were living with HIV in 2017 with 50,000 new HIV infections occurring the same year. Knowledge HIV-status is essential in the implementation of HIV prevention strategies. Yet uptake of HIV testing and linkage to care among men is generally lower than that of women. Limited information exists on percentage of people especially who know HIV-status in Uganda. We therefore assessed the prevalence of HIV-status knowledge among men aged 15 – 59 years in rural Uganda.

Methods

A population-based cross-sectional study was conducted among males, aged 15-59 years in Butambala, Gomba and Mpigi districts in Uganda. Participants reported if they had been tested for HIV before and what the test results were. Afterward, participants were counseled and tested for HIV. Data were collected between November 2015 and May 2018. The outcome variable was correct knowledge of HIV-status, categorized as “knows HIV-status” or “does not know HIV-status”. We conducted bivariate and multivariable logistic regressions to determine the correlates of HIV-status knowledge.

Results

In total 7,976 males were included in the analysis. The mean age of the participants was 29.6 years (SD 10.3). About half (49.0%) had attained primary education. The majority (82.3%) of all men (N=7,976) knew their HIV-status. Among HIV-infected men, 40.1% (83/207) knew their HIV-positive-status. Among all men: every one-year increase in age was associated with increased odds of correctly knowing their HIV-status (aOR 1.02, 95% CI 1.01 -1.03). Other factors associated with increased odds of correct HIV-status knowledge included: level of education, secondary (aOR 1.71, 95% CI 1.50 – 2.00) and tertiary (aOR 1.99, 95% CI 1.50 – 2.64) each compared with primary level; and being circumcised (aOR 2.03, 95% CI 1.79 – 2.30). Among HIV-infected men, an increase in age was associated knowledge of HIV-positive status (aOR 1.09, 95% CI 1.05 –1.13).

Conclusion

While knowledge of HIV-status was high among all men combined, it was alarmingly low among HIV-infected men. HIV-status knowledge was higher among older, educated and circumcised men. Efforts need to be scaled-up to ensure the majority of HIV infected men gain access to HIV testing.

Session D-4

Oral Interdisciplinary 10
Friday, March 1, 2019, 3:00 pm
Location: Aztlan

421 3:00 pm

Roman Imperial Matrons: A History of Calculating Women From Livia to Julia Domna

Hannah Friesen, History (U)

The history of the Roman Empire is often one told from the male perspective. Emperors with unimaginable power and influence, glorious military campaigns, and vast territories waiting to be exploited for the Roman people. This is how Hollywood portrays these men above men. However, as more and more women have joined the field of history, female narratives are receiving attention like never before. This is also true for my topic, Roman Imperial Matrons: A History of Calculating Women from Livia to Julia Domna. I will be refocusing the study of this time period to the ambitious mothers and wives behind the great emperors. Utilizing evidence such as ancient literature, statuary, numismatic, and artistic evidence, I will argue that imperial matrons’ advantageous marriages and access to wealth played a substantial role in the social and political success of women. For these reasons, a woman’s position within society was always tied to a man. It is apparent in ancient sources that women were always supporting characters instead of the leading character, and anything that strayed from this narrative was unacceptable. And while a woman’s power may be implicitly linked to a man’s, each woman who wielded it found a way to make it her own. Women’s history is an interdisciplinary subject that has only recently come to the forefront of academics, with scholars who aim to unravel the mysteries of women over time. Thus, it is vital that we look at this period from both male and female perspectives because otherwise, we only receive half the story.

422 3:15 pm

Constructing a Meaning of Freedom: A Gendered Perspective of the Actions of Formerly Enslaved Men and Women in the American South, 1860 – 1880

Scott Thiele, History (M)

Historians since the 1960s have debated the ways in which former slaves claimed their freedom during and after the Civil War. While gender has been used as a category of analysis in examining enslaved women’s actions following emancipation, in works such as Leslie Schwalm’s, A Hard Fight for We: Women’s Transition from Slavery to Freedom in South Carolina, the influence of gender on former bondsmen’s responses to freedom has received less scholarly consideration. Likewise,

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little attention has been focused on how other elements of identity complemented or complicated the gendered understandings of freedom articulated by former slaves. My research assesses how different aspects of identity, with particular focus on gender, shaped the meanings ascribed to freedom by those formerly enslaved in the American South during the period of 1860 – 1880s. After establishing how emancipation created gendered understandings of freedom, my research explores the efforts of the formerly enslaved to reify their concepts of freedom.

Through textual analysis of primary evidence --- including letters and petitions written by black soldiers, narratives composed by former slaves, diaries of former slaveholders and government records such as reports issued by the Freedmen's Bureau --- my research demonstrates that formerly enslaved African American women focused on four fundamental elements in defining and exercising their freedom, consistent with an understanding of their roles as women and mothers in charge of their bodies and families: asserting parental rights over their children, defining the terms of their labor service with white employers, disputing the deference expected by former slave owners and appealing to legal authorities for assistance in asserting their rights. African-American men understood of freedom as an expression of "manhood" composed of elements previously denied to them in slavery: proving themselves (their bravery, self-worth, and self-reliance), attaining literacy, and demonstrating self-determination in the public sphere. This research is intended to expand our appreciation of how different elements of identity shaped the understandings of freedom of formerly enslaved women and men.

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423 3:30 pm

The W.I.T.C.Hing Hour: the forgotten history of W.I.T.C.H during the second wave of the Women's Rights Movement in the US

Jade Connolly-Cepurac, Double Major in History and Political Science (U)

This article dives into the American cultural linkage of women and the malevolent witch through the lens of a movement. The organization entitled Women's International Terrorist Conspiracy from Hell or W.I.T.C.H. used satire and street performance to mock the stigma that feminists are witches. The movement initially spawned in the 1960s for a brief period; however, W.I.T.C.H has been revived after the 2016 election.

Most current literature examines feminist organizations through two significant filters, first is the group that attracts more attention by being extreme, secondly through organizations that have survived to the present day. Because of these limits, the scholarship detailing W.I.T.C.H is limited compared to other organizations because W.I.T.C.H does not fall into either category. W.I.T.C.H defies previous notions of movements by refusing to appear innocent and appear to be the first intersectional feminist group. Analysis and further research on W.I.T.C. H's will expand to the broader realm. For example, W.I.T.C.H's push for public history and its irregular stance contradicts previous notations of social movements. This essay seeks to examine, and present the history of the emergence of the original W.I.T.C.H, secondly the substance of the organization's activism, thirdly the decline in coordination due to disagreement with other feminist groups, and finally, the groups lasting outcome.

Through this essay, I have exposed the connotations and symbolism of the witch, that were tied to American women in the 1960s through 1970s. With the foundation of using the burning times as a form of "personal holocaust," W.I.T.C.H that sought to regain the term analogous to the LGBT+ term "queer." The group wished to shift the connotation of "witch" and expanded its goals past women's rights; however, W.I.T.C.H has been virtually ignored by most scholars as an influential group in the women's liberation movement in America during the second wave of feminism.

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424 3:45 pm

Finding A Place You Feel at Home: The Communicative Construction of Belonging at A Women's Resource Center

Kylie Lynch, Communication and Philosophy (U)

The Women's Resource Center is a place aimed at creating a space for the women on campus. They use a range of communication strategies to construct a sense of community with those who visit and work there. A sense of belonging is created through the community shared by those who enter this place and the atmosphere created and guidelines followed by those within it. The images, signs, and speak used in the Women's Resource Center project the overarching message had there, "You Belong Here". Through our findings, we discovered three ways in which the Women's Resource Center fostered a sense of belonging while in the space. These three include using inclusive language, providing a space of empowerment, and creating communication between visitors.

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425 4:00 pm

AI trouble: Queer theory in the age of the intelligent machine

Gabrielle Peñaranda, Philosophy (M)

As artificial intelligence becomes more prevalent in our daily lives, one might expect that these systems reflect the diverse, multifaceted, and complicated world we live in. However, this is not the case. Artificial intelligence systems reflect stereotypical representations of sex and gender. This paper argues that queer theory can be a valuable asset to computer scientists as they continue to develop thinking machines. The intersection of artificial intelligence and queer theory is a prime location for staging a conversation about sex and gender biases in the tech industry. When humans create an artificially intelligent machine, they apply their own conceptions of what a human is into their creations and in doing so perpetuate normative conceptions of sex and gender. This paper also posits that media and commerce play significant roles in influencing the public's normative conceptions of AI and sex and gender in that intelligent machines are often portrayed in film and TV as subservient and female. The aim of this paper is to encourage

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a dialogue from which queer theorists and computer scientists can work together to overcome not only misconceptions of sex and gender but also to build a future of inclusivity and diversity.

Session D-5

Oral Interdisciplinary 11
Friday, March 1, 2019, 3:00 pm
Location: Metztli

426 3:00 pm

University Supervisor Feedback To Teacher Candidates With High and Low Performing edTPA Scores Utilizing a Video-Based Coaching Tool

Brian Burgess, Psychology (U)

Increasingly teacher-education video-based coaching tools are used to support teacher-candidate development (Bower, Cavanagh, Moloney, & Dao, 2011; Fadde, & Sullivan, 2013). It is important to understand how these tools can facilitate development of teacher-candidates' pedagogical skills.

The purpose of this study is to examine to what extent university supervisors provide different amount and type of feedback to teacher-candidates who completed their credential program with high versus low edTPA scores.

Two teacher candidates with high edTPA scores and two with low edTPA scores were selected from a pool of 124 multiple-subject teacher-candidates. Their three University Supervisors used the Sibme online platform to provide feedback on 9 – 13 videos of each teacher-candidate, and to match each instance of feedback to one of 30 essential pedagogical skills.

A previous study used factor analysis to reduce the 30 essential pedagogical skills from the edTPA rubric into 4 latent variables, identified as leadership, learning environment, engagement, and student centered (Chizhik, & Chizhik, in press; Chizhik, Chizhik, Burgess, Hernandez, Tanmajo, in press). These 4 latent variables were used to conduct a four (latent variables) by four (two high and two low edTPA scores) chi square analysis to examine whether the frequency of pedagogical skills in feedback statistically significantly differed from a random distribution.

After examining the data for the four teacher candidates, results indicate statistically significant differences in frequencies of particular types of pedagogical skills included in feedback for teacher candidates with lower vs higher edTPA scores, $X2$ (9, $N = 272$) = 17.55, $p < .041$. In particular, teacher candidates who scored lower tended to receive more feedback on Learning Environment pedagogical skills, while teacher candidates who scored higher tended to receive more feedback on Engagement pedagogical skills.

By identifying frequency and type of feedback that are connected to stronger performance on the edTPA, teacher education programs can better support development of essential pedagogical skills among their teacher candidates.

427 3:15 pm

Mechanical injury alters APP and BACE-1 interaction in hiPSC-derived neurons

My Tran, Psychology & Speech, Language and Hearing Sciences (U)

Traumatic brain injury (TBI) is one of the most significant environmental factors that contributes to the risk of developing Alzheimer's disease (AD). Numerous clinical and experimental data have documented that TBI could elevate the level of amyloid-β peptide (Aβ) -- a neuropathological hallmark of AD. Aβ is generated via sequential proteolytic cleavage of transmembrane amyloid precursor protein (APP) that is initiated by β-secretase (BACE-1), the key rate-limiting enzyme in APP processing. We previously developed a silicone-based microfluidic device that applies sub-lethal mechanical strain on human induced pluripotent stem cell (hiPSC)-derived neurons, mimicking the biomechanical stretching and tension that brain tissues experience during TBI. Similar to previous findings, we also found that mechanical injury increased the level of extracellular Aβ and altered APP processing in neurons. Building upon these data, we explored whether mechanical injury would modulate APP/BACE-1 colocalization in hiPSC-derived neurons. We utilized Optical Convergence of APP and BACE-1 (OptiCAB) assay to visualize the transient, irreversible protein-protein interaction between APP and BACE-1 in celluo. This live imaging technique is based on Bimolecular Fluorescence Complementation (BiFC) technology, whereby two complementary non-fluorescent protein fragments produce a fluorescent signal when in proximity with one another. Based on this method, we transfected hiPSC neurons with APP and BACE-1 tagged with Venus N-terminus and C-terminus fragments, respectively. We detected that, upon inflicting mechanical strain on the neurons, there was an increased Venus fluorescence intensity in the cell body, indicating that there was an enhanced APP/BACE-1 interaction following injury. There was no difference in fluorescence signals in the axons between injured and non-injured neurons. In future experiments, we will pharmacologically interrupt APP and BACE-1 cellular trafficking to investigate whether this interference abrogates the rate of Aβ production. Taken together, the results provide new evidence that TBI modifies APP and BACE-1 trafficking, and this, in turn, impacts the mechanism of Aβ processing. This provides support for the development of new therapeutic treatment for TBI and AD that targets the underlying trafficking pathways of APP and BACE-1.

428 3:30 pm

Learning from the Past to Predict Future Funding Approaches and Research Breakthroughs

Gudur Ashrith Reddy, Bioengineering (D)

Advances in indexing and search algorithms have made it easy to find, follow and cite new research in any academic field. However it has also lead to a tremendous increase in the number of outlets publishing research, the total number of research publications, and overall research output. This makes it impossible for any individual to track, collect and analyze all

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the new information on a particular topic. It can also result in some "reinventing of the wheel", important research findings staying hidden in obscurity for long periods of time, excessive research on "white elephant" dead-end research topics and so on. All of these ultimately lead to wastage of precious research funding and resources. We aim to remedy this by analyzing all of past research publications in a particular subject using text-mining, network graphs, and topology driven network evolution. This will help us understand how research topics in that field have changed over time, what makes certain topics gain or lose traction, how different research topics are connected to provide a comprehensive understanding of the field, and ultimately what drives research on breakthrough topics that change the field. We will also analyze research funding to particular research topics in the field using the same tools to understand the relationship between research funding and research breakthroughs. Using this knowledge, we will be able to formulate ideal funding approaches towards research topics and guide research collaborations towards future breakthroughs. For the current work, we will focus on cancer as the primary research subject, mine 50 years of Pubmed data for publications on various topics in cancer research and 50 years of NIH NCI data for funding of various topics in cancer research.

429 3:45 pm

Anatomical correlates of language connectivity-based subgrouping in autism spectrum disorders

Yangfeifei Gao, Clinical Psychology (D)

Introduction: Autism Spectrum Disorders (ASDs) are heterogeneous developmental disorders associated with atypical functional connectivity (FC) and anatomy. Language impairments are pervasive, but their neural underpinnings remain elusive, partly due to heterogeneity across the ASDs population. Recent research supports the study of more homogeneous subsets of ASDs. The present study explored anatomical differences between subgroups of children with ASDs identified by distinct patterns of intrinsic FC within the language network.

Methods: FC analyses were conducted with 6-minute eyes-open resting state fMRI scans from 51 ASD and 50 typically developing (TD) youths, ages 8-17 years. Groups were matched on age, NVIQ, head motion, gender, and handedness (ps>.69). ASD subgroups were obtained using Gaussian finite mixture modeling of the FC between 14 language network regions (from meta-analysis by Rodd et al., 2015). T1-weighted anatomical scans were analyzed by subgroup. Local Gyrification Index (lGI), the ratio of cortical surface area buried within sulcal folds to the outer brain surface area, was calculated using FreeSurfer v.5.3.0. LGI was analyzed using a general linear model including age as a covariate. Results were corrected for multiple comparisons using Monte Carlo null-z simulations (cluster forming threshold $p<0.01$).

Results: Based on the lowest Bayesian Information Criterion, a 2-group solution best fit the ASD language network FC patterns. ASD Group 1 showed significantly greater intrinsic FC than the TD group for 15 connections between language regions (qsFDR<.05). Between the two ASD subgroups, Group 1 showed greater intrinsic FC for 37 connectivity pairs (qsFDR<.05). The same group also displayed higher Verbal IQ and lower symptom severity (ps<.05). Group 1 furthermore showed predominantly greater lGI than Group 2, with clusters of medium to large effect sizes located bilaterally in inferior temporal regions and in the right inferior parietal lobule, whereas a cluster of reduced lGI was observed in the left middle frontal gyrus.

Conclusion: Different subgroups within an ASDs cohort show distinct patterns of atypical FC of the language network. Less robust differences in cortical morphology (gyrification) were also found for these subgroups. Findings support the need to identify subgroups within larger ASD cohorts that may reflect divergent neurodevelopmental and behavioral trajectories.

430 4:00 pm

Focal Abnormalities of Cortical Thickness in Adults with Autism Spectrum Disorders (ASDs)

Jiwandeep Kohli, Clinical Psychology (D)

Introduction

Autism Spectrum Disorders (ASDs) are a group of highly prevalent lifespan neurodevelopmental conditions that show behavioral and neuroanatomic heterogeneity. Post-mortem studies report "patchy" abnormalities of cortical structure (e.g. indistinct lamination, cortical thickness changes) that vary spatially between individuals. These spatially variable cortical anomalies highlight a need for individualized approaches to investigations of brain structure in ASDs. This study examined focal abnormalities of cortical thickness (CT) in adults with ASDs using such an approach.

Methods

Following quality control, T1-weighted MRI scans for 20 ASD and 21 typical control (TC) participants matched on age (40-61 years) were compared. CT was measured with FreeSurfer v.5.3. Vertex-wise z-scores were calculated for each individual based on the TC means and standard deviations, with a leave-one-out procedure for TC participants. A $|z|\geq 2$ threshold was applied and cluster thresholded to identify "outlier" clusters for each participant. Total surface area of outlier clusters was summed separately for positive and negative z-scores, resulting in pos-load and neg-load outlier scores. Sums of absolute values gave an overall abs-load score. Group comparisons used non-parametric Mann-Whitney U-tests. Spearman's rank order correlations probed relationships between outlier load scores and IQ, Social Responsiveness Scale (SRS-2), and Autism Diagnostic Observation Schedule (ADOS-2) scores.

Results

Right hemisphere (RH) abs-load scores were significantly elevated in ASD ($p=.018$). The ASD group showed a significant positive association between the ADOS-2 restricted and repetitive behavior (RRB) subscale and RH abs-load scores ($rho=.50$, $p=.02$). The TC group showed a significant negative association between full-scale IQ and RH abs-load scores ($rho=-.51$, $p=.02$). The TC group also showed significant positive associations between SRS-2 total scores and LH

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neg-load (rho=.51, p=.04), LH pos-load (rho=.64, p=.006), and LH abs-load (rho=.57, p=.008) scores.

Conclusions

Our subject-specific approach detected a significantly higher RH outlier load as well as associations with symptom severity in ASDs. Focal clusters of significantly altered CT may relate to spatially variable patches of cortical disorganization reported in postmortem studies. Individualized, subject-specific approaches, as employed here, may allow examination and characterization of focal anomalies in larger populations, could help elucidate the behavioral heterogeneity of ASDs, and may support the identification of subtypes.

Session D-6

Oral Behavior and Social Sciences 15
Friday, March 1, 2019, 3:00 pm
Location: Templo Mayor

431 3:00 pm

Neuroanatomical correlates of executive function in mature adults with Autism Spectrum Disorders

Ian Martindale, Psychology (U)

Introduction

Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders characterized by impairments in communication and social interactions, and featuring restricted and repetitive behavior patterns. Executive functions, a set of complex cognitive processes including attention, planning, and behavioral inhibition, are often impaired in children with ASDs. These functions often decline during aging in people without ASDs, and this is accompanied by changes in the frontal lobe, a key brain area for executive function. Little is known about how executive function and its neural correlates change as individuals with ASDs enter middle and late age. The current study examined frontal lobe morphology, executive function, and relationships between these in middle-aged adults with ASDs and typical control (TC) participants.

Methods

41 participants (20 ASD, 21 TC) aged 41–60 years completed an MRI scan (T1-weighted; 0.8mm isotropic voxels) and the Color Word Interference (CWI) subtests of the Delis Kaplan Executive Function System. Cortical thickness (CT) and surface area (SA) were calculated using FreeSurfer software. Thirteen regions of interest (ROIs) per hemisphere were delineated within the frontal lobes. Independent t-tests were conducted to examine group differences and Pearson correlations were run to explore relationships between CWI subtest scores and brain measures exhibiting significant group differences.

Results

Both CWI subtest scores (inhibition, switching) were significantly lower in the ASD compared to the TC group. SA was significantly lower in the ASD group in nine of the 13 ROIs examined. No differences were found for CT. In the ASD group, there were no significant correlations between CWI scores and average SA for the affected ROIs. In contrast, four ROIs showed significant positive correlations in the TC group.

Conclusions

Reduced frontal SA observed in this study is consistent with previous findings in younger adults with ASDs. Correlations between SA and executive abilities detected in TD adults were absent in the ASD group, potentially suggesting disruptions in both frontal lobe anatomy and executive function in ASDs. Our study provides novel insights into neurocognitive differences between ASD and TC groups in later adulthood that expand our understanding of the aging process in this neurodevelopmental disorder.

432 3:15 pm

Anxiety symptoms correlate with altered brain functional connectivity on MRI in mature adults with autism spectrum disorders

Ryan Tung, Psychology (U)

Background: Behavioral evidence demonstrates that anxiety is more prevalent in children with Autism Spectrum Disorders (ASD) than in typically developing individuals and this persists into adulthood. Brain regions implicated in social anxiety have been found to have atypical functional connectivity in autism, indicating atypical patterns of communication between these regions. However, few functional MRI studies of ASD have taken comorbid anxiety into account, and it remains unclear whether this atypical connectivity is directly related to anxiety levels in this population. The current study examined functional connectivity between brain regions known to play a role in anxiety, relating this connectivity to direct measures of anxiety in mature adults with ASD compared to typical controls (TC).

Methods: 22 adults with ASD (16 male; Mage = 49.51 years) and 26 TC adults (22 male; Mage = 51.02 years) completed the Beck Anxiety Inventory (BAI) and a resting state functional MRI scan. 10 anatomically defined regions of interest implicated in a large meta-analysis of anxiety were assessed. Group differences on the anxiety measure and in functional connectivity were tested. Relationships between functional connectivity results and BAI measures were tested within ASD and TC groups, using partial correlations controlling for age and head motion. Results were FDR corrected and are reported at $p < .05$.

Results: Mature adults with ASD demonstrated significantly higher and more variable BAI scores compared to the TC group ($T(43) = 4.88$, $p < .001$). The ASD group showed underconnectivity between the left amygdala and left posterior insula, and between the left amygdala and the right insula. There were positive correlations between the BAI anxiety levels and 18 ROI pairs in the ASD group, particularly for connectivities involving the insula.

Conclusions: The current study replicates previous findings of increased levels of anxiety in adults with ASD, which should be evaluated and treated. Findings suggest that atypical connectivity previously reported between the examined regions may relate more closely to comorbid anxiety than to ASD

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itself, although it does not preclude the possibility that neural or experiential aspects of ASD may increase susceptibility to anxiety.

433 3:30 pm

Atypical Salience Network Connectivity in Toddlers with Autism Spectrum Disorders

Cynthia Ibarra, Psychology (M)

Autism spectrum disorders (ASDs) are complex neurodevelopmental disorders estimated to affect 1 in 59 children. Currently, ASDs are diagnosed based exclusively on behavioral criteria, despite a broad consensus that autism is a disorder of brain development. There is substantial evidence demonstrating that abnormal processing and responsivity to sensory stimuli are common and often impairing features of ASDs and have been observed in children with ASDs as early as 12-18 months of age. Further, atypical sensory modulation appears to be associated with deficits in social and adaptive skills in ASDs.

The salience network (SN) is an intrinsic brain network that plays a central role in detecting and orienting to relevant (internal or external stimuli); its function and connectivity patterns appear to be atypical in ASDs. The SN and especially one of its nodes, anterior insula (AI), receive convergent input from multiple sensory modalities. While there is evidence of network dysfunction in both SN and primary sensory networks in ASDs, little is known about functional connectivity between SN and sensory networks early in life in autism when sensory abnormalities are first observed in ASDs.

To address this question, the current study makes use of the data acquired under the SDSU Toddler MRI Project: Anatomical MRI and two functional MRI runs were acquired during natural, nocturnal sleep from 18 toddlers with ASDs (6 females; age 28 ± 7 months) and 19 typically developing (TD) toddlers (6 females; age 25 ± 7 months). Following standard preprocessing of fMRI data, region of interest (ROI) functional connectivity analysis was conducted with SN and sensory ROI's (sensorimotor and visual networks). Average pairwise (ROI-ROI) correlations were Fisher's z-transformed and directly compared between ASD and TD groups with two-tailed independent-sample t-tests.

In comparison to age-matched TD peers, toddlers with ASDs displayed weaker functional connectivity between SN (right prefrontal cortex) and sensorimotor regions (superior sensorimotor cortex; $p < .05$, FDR corrected. Further, while an age-related increase in functional connectivity within the SN was observed in TD children, it was absent in toddlers with ASDs providing additional evidence of the SN network dysfunction in the first years of life in ASDs.

434 3:45 pm

Neural Indices of Hyperexcitability in Individuals with Fibromyalgia as a Function of Pharmacological Treatment

Denali Woodruff, Psychology (M)

Fibromyalgia Syndrome (FMS) is a chronic condition characterized by widespread musculoskeletal pain associated with increased anxiety, depression, insomnia, and cognitive impairments. Increasing evidence supports the central sensitization hypothesis, suggesting that FMS pain is of central, rather than peripheral origin, but studies of the neural indices are scant.

Our study was designed to investigate neural responses to uncomfortable somatosensory and innocuous auditory stimuli in individuals with and without FMS. We recruited 19 participants diagnosed with FMS and 19 healthy control participants (overall mean age [±SD] = 51.7 ± 13.9 years) otherwise matched on sociodemographic variables and cognitive function. Following extensive neuropsychological assessment, EEG signals were recorded while participants underwent a classical conditioning experiment.

Experimental trials included a CS+ tone followed by a 50ms electrocutaneous sensation (UCS) delivered to the shin, at a current determined by each subject as being uncomfortable, but not painful. CS- tones were not followed by UCS. Participants rated their pain and anxiety levels on a visual analogue scale following each trial. Event-related potentials were compared between two FMS subgroups, those taking GABA agonists, which enhance inhibitory neurotransmission, (e.g. gabapentin, FMS-GB) or other, mostly antidepressive medications (FMS-Other), in consideration of the effects of medication treatment on neural activity.

The N100 to the electrocutaneous sensation was reduced in FMS-Other patients, whereas in FMS-GB this deflection was indistinguishable from the one observed in Control participants, indicating N100 normalization under GABA-ergic medication. The N100 reduction was correlated with pain levels as assessed by a standardized tender point survey. In addition, FMS-Other patients produced larger N170 amplitudes following the CS+ tones relative to both FMS-GB and Control groups. The N170 amplitude correlated with anxiety ratings provided by FMS patients. This finding is indicative of generalized hypervigilance characterizing FMS and is consistent with reports of symptom alleviation by medications targeting inhibitory pathways.

Collectively, the present results suggest that these neural measures could serve as physiologically meaningful biomarkers of altered brain function in FMS. Furthermore, they provide insight into the role of central excitatory and inhibitory neurotransmitter imbalance in FMS symptoms, and how certain medications can provide relief by suppressing neural hyperexcitability.

435 4:00 pm

Neural Dynamics of Contextual Processing and Word Learning

Jacob Momsen, JDP in Language and Communicative Disorders (D)

During language processing, people use different sources of contextual information to rapidly develop graded expectations about upcoming words. When words are learned implicitly (i.e., not through explicit instruction) information contained

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in the surrounding sentence context provides constraints on the possible meaning of unknown words. The current study uses EEG methodology to investigate how adults and children with various developmental profiles exploit information from sentence context to support word learning. Identifying the neural mechanisms involved in this process will help refine our understanding of how children affected by different language disorders are able to pre-activate relevant information in semantic memory during online sentence comprehension and apply it to novel word forms over repeated exposure.

Participants listened to series of three naturally paced sentences each containing an identical pseudoword and attempted to use sentential context to identify its potential meaning. Meaning associated with the critical word was contrived by introducing differences in the cloze probabilities of the three sentences, where triplets included either highly constrained (meaningful) or unconstrained (meaningless) sentences. Offline, child participants completed measures of vocabulary knowledge, general language (semantics, syntax) skills, phonological working memory, and nonverbal cognition to explore relationships between these variables and functionally relevant neural activity elicited during the word learning task.

Time-locked neural data will help index successful word learning via the modulation of responses to semantic expectancy violations (ie, the N400) on the critical pseudoword. Additionally, a spectral analysis of the EEG data measured during the unfolding sentence triplets will provide a window into various aspects of incremental language processing, including long term memory retrieval and the binding of semantic and syntactic information into coherent message representations. The current study will offer valuable insight into how contextual processing and word learning is differentially implemented by both children and adults.

436 4:15 pm

Matching pictures and signs: an ERP study of the effects of iconicity and structural alignment in American Sign Language

Meghan McGarry, Speech, Language and Hearing Sciences (D)

We used Event-Related Potentials (ERPs) to investigate the effects of sign iconicity (a non-arbitrary mapping between form and meaning, e.g. the iconic sign CAT depicts a cat's whiskers) and alignment (structured mapping between sign form and meaning, e.g. the sign CAT aligns with a picture of a cat with prominent whiskers, but not with a cat seen from behind). We examined whether iconicity and/or picture-sign alignment modulated the N400 component, which is a negative-going wave that peaks 400ms after stimulus onset and has been shown to reflect lexico-semantic processing. Deaf native signers were presented with 360 black and white line drawings depicting 180 concepts, followed by videos of ASL signs where the meaning either matched or did not match the object shown in the preceding picture. In the matching condition, 60 signs were aligned with the preceding picture, 60 were not aligned, and 60 were non-iconic fillers. Participants pressed a button indicating whether the picture and the sign matched or not. Hearing controls saw the same pictures followed by videos of spoken English. As there is no form overlap between spoken English and pictures, the English words were neither aligned nor non-aligned with the pictures, and thus no effects of alignment were expected. ERPs were time-locked to the onset of the sign or the spoken English word and averaged offline. For ASL signers, response times for signs with aligned pictures tended to be faster than signs with non-aligned pictures, and there were no reaction time differences for English words. For the deaf signers, the N400 response to signs in the aligned picture condition showed reduced amplitude compared to those in the non-aligned condition. This finding suggests a priming effect that occurs during lexico-semantic processing when the visual features of an aligned picture overlap with the iconic features of the to-be-matched sign. No effect of alignment was found for hearing English speakers. Overall, the results indicate that the structural alignment between visual features of an iconic sign and a picture facilitates comprehension. The presence of effects during the N400 window suggests that this facilitation occurs at the level of lexical retrieval.

Session D-9

Poster Engineering and Computer Sciences 7
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

437 2:15 pm A

Automated Cruise Control

Anthony Savitt, Computer Engineering (U)

'Automated Cruise Control' is a project that aspires to test the possibilities of the future of automotive travel. In today's climate, many leaders in the automotive industry are turning towards automation, with the most notable ,Tesla, leading the charge. While this is an exciting endeavor to be pursued, one of the most important aspects in its development pertains to safety. In this project we are investigating the analysis and optimization of time and safety critical aspects of vehicle automation.

Our tests are performed on two small robotic vehicles equipped with optical sensors. Through these sensors, the manipulation of data they provide, and two microcontrollers, these vehicles can follow each other while maintaining distance from one another. If one car speeds up, the other does as well, and vice versa. This project takes a look at the design elements of vehicle automation that are necessary to produce not only a viable product, but a safe product. This project is a stepping stone onto what the future of automotive travel could be like, where all cars could base their speed around one another to help increase the flow of traffic.

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438 2:15 pm B

Single Barrier Discharge Plasma Actuators as a Form of Roll control and Drag Reduction

Levi Schlapfer, Aerospace Engineering (U)

This poster will discuss some of the major aspects of using plasma actuator rocket fins as a form of roll control on a sounding rocket. The main objective is to decrease skin friction drag and wake drag on a sounding rocket through the use of single barrier discharge plasma actuators. The plasma actuator is to be activated during the optimal time frame during the flight to maximize the overall stability of the vehicle. A plasma actuator was manufactured by mounting two plates of copper electrodes in parallel onto each side of an acrylic dielectric plate. It was successfully tested in a lab setting. In preliminary tests, the Metal Oxide Semiconductor Field Effect Transistor (MOSFET) overheated, melting the silicon boundary causing a short in the electrical circuit. A larger heat sink is planned to be added to the MOSFET drain to prevent this. The plasma actuator has shown great promise in generating a local jet flow in a test environment that ultimately can enable the capability of flow control across rocket stability fins. Future plans include the testing of the plasma actuator in the wind tunnel. The plasma actuator will also be geometrically and systematically optimized to produce stronger forcing effects and decreased power consumption.

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439 2:15 pm C

Increasing the Lifetime of Piezoelectric Diaphragms within Synthetic Jet Actuators

Jennifer Martin-Velazquez, Aerospace Engineering (U)

We present a study on the usage of piezoelectric disks within synthetic jet actuators. Synthetic Jet actuators are frequently used in various cases when flow separation occurs. Whether an airplane is in flight or a turbine blade rotates flow separation can occur. This separation occurs over an airfoil or when turbomachinery is used off design. The phenomena of flow separation increases the drag, making vehicles less efficient by an increase in fuel usage and decreased runtime. Studies show that flow can be controlled though an active or passive form. Active form would include an apparatus that reacts to changing conditions in the flow. Passive form devices have a constant state. The past two years Synthetic Jet actuators (synjets) have been studied at the San Diego State University. The focus is flow over an airfoil using separation control. The synjet is a piezoelectric diaphragm encased by a 3D printed cavity. A sinusoidal voltage applied to the piezoelectric disk oscillates it, creating a jet of air used to control the suction side of the airfoil. Over the past decade piezoelectric actuator studies have concentrated on actuation performance and on enhancing actuation displacement, but little has been done to ensure the integrity and reliability of these disks. We present the introduction to recent research conducted using piezoelectric disks and what changes can be made to increase the lifespan of the piezoelectric diaphragms. This will be done by testing the strength of the disk by cyclic loading, as well as testing within a NACA airfoil. Our goal is to give the audience a basic understanding of both the material properties and the new techniques that can be applied to this new research project.

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440 2:15 pm D

Unmanned Aerial Systems: Nonlinear High-Fidelity Aeroelastic Analysis

Enrico Santarpia, Engineering Science (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 insect 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 goal is to introduce a numerically efficient nonlinear aeroelastic model for high-fidelity simulation of Unmanned Systems to study the effect of wing structure on the flight performance.

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441 2:15 pm E

Frequency based determination of small-strain constrained modulus in crushing sands

David Riley, Civil Engineering : Geotechnical (M)

A novel technique for determining the small-strain constrained modulus of sands is described. The soil specimen is loaded in one-dimensional compression and acoustic emissions (AE) produced by the breaking grains are captured by a piezotransducer on which the specimen lies. The small-strain constrained modulus is then calculated from the evolution of the AE frequencies as compression ensues. The results are in good agreement with results from the pulse transmission method.

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442 2:15 pm F

Roller Coaster Dynamics

Angelina Forzisi, Mechanical Engineering (U)

The student's effort initial effort works from a parameterizable linear track design h(x) function and dynamics of a kinetic and potential energy system for the uphill and downhill ride of the rollercoaster, combining a linear and nonlinear resistance term.

From this the revisions on the dynamics for a track that curves longitudinally are considered (assuming that the curves are banked to minimize additional losses) and the perceived g-forces for the rider are assessed. This force and the visual perception of turns, peaks, and valleys, are considered in the evaluation of a "thrill factor".

A simplistic lump model of the human rider is advocated for the evaluation of stresses in relationship to the thrill of the ride. High g forces create stresses and changes are even more stressful. Our primary hypothesis is that stress and thrill

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are correlated, but we may also obtain an optimization that considers what is achievable within the constraints of the ride design.

Session D-10

Poster Biological and Agricultural 6
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

443 2:15 pm G

Identifying Alphaproteobacteria Genes Necessary for Animal Metamorphosis

Alexandra Strom, Biology (U)

The swimming larvae of many marine animals identify a suitable location to attach to the seafloor by using bacteria as a metamorphosis cue. Animals from diverse taxa metamorphose in response to bacteria, suggesting this phenomenon is both ancient and conserved. For the model tubeworm, Hydroides elegans, many but not all bacteria induce the metamorphosis. However, the types of bacteria that induce metamorphosis and the inducing cues they produce remain enigmatic. To define a new group of bacteria that stimulates metamorphosis, we created a phylogeny of Alphaproteobacteria strains including Roseobacter and Flavobacteria species and showed that 451 bacterial isolates induce metamorphosis in our model interaction. With this basic framework for understanding the ability to induce metamorphosis, we further aim to identify the cue by which the biofilms of alphaproteobacteria strains Rugeria halocynthiae (G) and Phaeobacter gallaeciensis (P. gall) induce metamorphosis in Hydroides elegans larvae. To address this aim, we created a random library of mutant bacteria by mating the G and P. gall strains with an E. coli strain carrying the psc189 transposon plasmid. We are currently screening the resulting mutant library to search for those few mutants who fail to induce Hydroides metamorphosis. These mutants will be candidates for further genetic analysis, and ultimately insightful for identifying the bacterial stimulatory cue causing tubeworm metamorphosis.

444 2:15 pm I

Animal Metamorphosis-inducing Potential of the marine Gammaproteobacterium, Pseudoalteromonas luteoviolacea

Amanda Alker, Cell and Molecular Biology (D)

Whether they are suspended in the water column, or found on submerged surfaces, microbes are ubiquitous entities in the ocean, and have been ever-present in the evolution of animals. Bacteria coating the sea floor are considered environmental indicators that cue the permanent settlement and metamorphosis of invertebrate larvae on the benthos. While the role of bacteria in the induction of metamorphosis has been established, just a few examples of the underlying mechanism have been characterized, and further, their ecological implications remain unclear.

To study how bacteria stimulate animal metamorphosis, we focused on the bacterium Pseudoalteromonas luteoviolacea, previously shown to be a strong inducer of tubeworm, coral, and urchin metamorphosis. A pangenomic analysis of 19 sequenced P. luteoviolacea strains indicated that the genes necessary for producing two factors previously shown to stimulate animal metamorphosis are present within the bacterial genomes; Metamorphosis Associated Contractile Structures (MACs) and Tetrabromopyrrole (TBP). To determine if there is a preferential role of one factor over another in the process of P. luteoviolacea-induced metamorphosis, we created genetic knockout mutants for both MACs and TBP. Metamorphosis assays on tubeworms, hydroids, and corals will determine if a particular mechanism evokes a metamorphic response.

445 2:15 pm J

From egg to adult depending on microbes: Interrogation of Hydractinia metamorphosis in response to marine bacteria

Nathalie Delherbe, Joint Doctoral Program in Cell and Molecular Biology (D)

For many marine animals including sponges, worms, and urchins, the transition from egg to adult requires an intermediate process in which some cells die while others proliferate with high precision in a cellular choreography known as metamorphosis. Many of these animals live out their adult life on the sea floor and use environmental cues as indicators of a preferable habitat. Surprisingly, one important cue for many animals that undergo metamorphosis is surface-bound bacteria. Although the phenomenon of bacteria-stimulated metamorphosis was discovered over 80 years ago, the cellular mechanisms by which these animals sense and respond to bacteria by undergoing metamorphosis remains enigmatic.

To advance our understanding of ancient and conserved mechanisms of bacteria sensing, we study how bacteria induce the metamorphosis of the emerging model Cnidarian Hydractinia symbiolongicarpus. In this work, we aim to determine if Hydractinia larvae depend on a bacterial signal for metamorphosis by generating gnotobiotic Hydractinialarvae. In addition, we will identify types of bacteria that induce metamorphosis and identify the stimulatory factors and sensing mechanisms using genetic, cell biology and biochemical techniques.

446 2:15 pm K

NineTeen Complex member, prp19, is essential for stem cell regulation in planarian flatworms

Madison Balagtas, Cellular and Molecular Biology (U)

Ubiquitination is a cellular signaling pathway that involves the post-translational modification of proteins with the polypeptide ubiquitin. Ubiquitination is a regulator of many cellular

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processes, including, cell cycle regulation, transcription, and proteasomal degradation. The specificity of ubiquitin signaling is conferred by E3 ligases, a class of proteins that are the terminal step of the ubiquitylation enzymatic cascade. Despite their essential role in ubiquitin signaling, the roles and protein targets for most E3 ligases remain uncharacterized, especially in the context of regeneration and stem cell regulation. We use the planarian flatworm, Schmidtea mediterranea, as an in vivo model to study the role of E3 ligases in stem cell biology and regeneration, since planarians possess a large population of adult pluripotent stem cells that allows them to completely regenerate after nearly any injury. We performed a reverse genetic screen to identify E3 ligases from the U-box domain containing (U-box) gene family that are regulators of stem cell function by using RNA interference (RNAi) to reduce gene function and probing for phenotypes characteristic of stem cell dysregulation. We screened eight U-box genes and chose for further analysis, pre-mRNA processing factor 19 (prp19), which presented phenotypes stereotypic of stem cell dysregulation, including head regression, ventral curling, and eventual lysis. Prp19 is a member of the spliceosomal protein complex NTC (NineTeen complex), and has roles in mRNA splicing, transcriptional elongation, and recruiting ubiquitinated proteins to a proteasome. To understand the role of prp19 in stem cell regulation we used an M-phase antibody (phospho Histone H3) to quantify the number of mitotic cells after prp19 inhibition and found a significant decrease relative to control worms. Additionally, we performed TUNEL assays to examine the effect of prp19(RNAi) on apoptotic rates in the worms and found a significant increase in the number of apoptotic cells. We inhibited four other members of NTC and found phenotypes consistent for prp19 knockdown, which suggests that the observed prp19(RNAi) phenotypes are caused by a reduction in spliceosome function. This research identifies prp19 as an essential regulator of stem cells, likely through its action as a member of the NTC complex.

447 2:15 pm L

PyFBA: Modeling Metabolomics from Genomics

Shane Levi, Bioinformatics and Medical Informatics (M)

Whole-genome microbiological studies are becoming more dependent on computational methods but are limited by the tools available. With the ability to rapidly annotate function and reconstruct an organism's biochemical pathways it is now possible to examine their metabolism as a whole. Flux-balance analysis (FBA) is a linear programming method to predict phenotypic outcome from a metabolic model and a set of imposed environmental restrictions. Using a microorganism's sequenced and annotated genome we can develop a mathematical model representative of their metabolic map. A single equation within this system is identified as the objective function, and all other equations are optimized to maximize flux through this function. PyFBA is an open-source Python package designed to build and test these metabolic models using functionally annotated genomics data in conjunction with the Model SEED biochemistry database. It is capable of reconstructing a microbe's metabolism, gap-filling missing functions, and running FBA within various media and external conditions.

448 2:15 pm M

Machine learning method for identifying source environment of meta-genomes

Jillian Burke, Bioinformatics (M)

Metagenomics aims to understand the vast diversity of microbial life that inhabits nearly every environment on the planet. In order to grant researchers more access to the increasingly large amount of existing metagenomic data, the Short Read Archive (SRA), a public database that now houses over 100,000 whole-genome sequence metagenomes, was created. However, there is currently has no standard way to describe or classify the environmental sources of the sequences that get uploaded to that database. The lack of an enforced ontology resulted in ambiguous or uninformative source locations for many sequence datasets. Problems such as these make it difficult to quickly and reliably search the database, limiting its usefulness as a research tool. This project aims to create a standard classification system for metagenomes, as well to develop a machine learning based method that can accurately assess what environment a metagenome was sampled from relying only on the content of the sequence data. Applying this method to all the metagenomes in the SRA in order to predict the true location source will increase the accuracy and utility of this database.

Session D-11

Poster Biological and Agricultural 7
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

449 2:15 pm N

Understanding the mechanism of allosteric inhibitors on a wide spectrum of IDH1 mutants

Diego Avellaneda Matteo, Biochemistry (D)

Isocitrate dehydrogenase 1 (IDH1) is responsible for the NADP+-dependent oxidative decarboxylation of isocitrate to α-ketoglutarate (αKG) in the cytosol and peroxisomes of cells. Mutations in IDH1 have been linked to a wide variety of cancers, including brain cancer. 80-90% of lower grade glioma and secondary glioblastoma patients have mutations in IDH1. A point mutation at R132, most commonly to histidine, destroys the native enzymatic activity but facilitates a new neomorphic reaction, the NADPH-dependent reduction of αKG to D-2-hydroxyglutarate (D2HG). D2HG acts as an oncometabolite since it inhibits several αKG-dependent enzymes involved in gene regulation and DNA repair to drive tumorigenesis. Previously, we kinetically characterized several R132 mutants and found that the neomorphic reaction is supported by residues that typically are smaller and more

hydrophobic. We also showed that a mutant form found in tumors (R132Q) is highly efficient at catalyzing the neomorphic reaction but also conserves its native activity. Mutant IDH1 has proved to be an effective therapeutic target, with recent FDA approval for an inhibitor highly selective for mutant IDH1 over wild type. However, the understanding of inhibition activity against a wide range of R132 IDH1 mutants is still lacking. We hypothesized that since R132Q IDH1 maintain its wild type activity, it may have wild type-like conformations that preclude effective inhibitor binding. We performed inhibition assays to test activity of three different IDH1 inhibitors against a large range of R132 IDH1 mutants. We found that the biochemical IC50 for R132Q IDH1 is up to 16,300-fold higher than R132H. Since the structure of R132Q is yet to be solved, we created a R132Q mutant model and performed molecular dynamics (MD) simulations to study the structural consequences of the R132Q mutation. MD simulations showed that R132Q exists in conformations that are both similar to WT and mutant IDH1. These results could explain the ability of R132Q to conserve its WT activity and appear resistant to mutant IDH1 inhibitors. This work sets an important foundation in understanding the allosteric mechanism of IDH1 inhibitors as well as predicting the possible success of future therapies with patients harboring mutations such as R132Q IDH1.

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450 2:15 pm O

Modulating the reversible MDH1 catalytic reaction in squamous non-small cell lung cancer

Joi Weeks, Cell and Molecular Biology (D)

Malate dehydrogenase (MDH) drives glycolysis through its reversible coenzyme system NAD+/NADH by interconverting oxaloacetate and malate. Amplifications of the cytosolic form of MDH (MDH1) in squamous cell non-small-cell lung cancer (NSCLC) correlate with poor patient prognosis and reveal a reliance of NSCLC on high glycolytic activity. Elucidation of changes in activity of the metabolic enzyme MDH1 leading to altered cell behavior and tumorigenic progression, has yet to be determined. Thus, our interest lies in identifying the chemical and cellular characteristics required to drive the reversible MDH1 catalytic reaction in squamous cell NCSLC. Previously, we have shown that metabolic dehydrogenases are regulated by microenvironmental changes in pH and oxygen levels. Currently, we are evaluating various cell lines to gain a better understanding of how the MDH1 reaction can be altered to decrease the tumorigenic capacity of squamous cell NSCLC. Experimental knowledge obtained has the potential to increase our understanding of the MDH1 reaction and educate the design of future anti-tumor therapeutics.

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451 2:15 pm P

Catalytic characterization of mutant isocitrate dehydrogenase 1

Giovanni Quichocho, Chemistry: Biochemistry (U)

Brain tumors have a >60% mortality rate within 5 years of diagnosis. Mutations in isocitrate dehydrogenase 1 (IDH1) can drive tumorigenesis, including in >70% of low-grade gliomas and secondary glioblastomas. The NADP+-dependent IDH1 enzyme, which is a homodimer, catalyzes oxidative decarboxylation of isocitrate to α-ketoglutarate (αKG). A mutation found in tumors results in a neomorphic reaction, the production of D-2-hydroxyglutarate (D2HG) from αKG through oxidation of NADPH. In tumors, a single-point mutation occurs in one subunit, with the other subunit being wild-type (WT), creating a heterodimer. Previous work in our lab has been performed using homodimer IDH1 enzymes, with both subunits containing the same mutation. To generate a better model of the tumor-relevant form of the enzyme, we will create and study the IDH1 heterodimer catalyzing both the normal and neomorphic reaction. We hypothesize that the IDH1 heterodimer will channel αKG produced in the WT monomer to the, mutant monomer to generate D2HG. To test this hypothesis, we generated cDNA constructs and heterologously expressed and purified IDH1 from E. coli. Kinetic assays were performed to determine normal and neomorphic reaction rates. From this information we will clarify the basic kinetic features of an important driver of tumorigenesis.

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452 2:15 pm Q

Optimization of heterologous malate dehydrogenase 1 expression and purification

Ngoc H. Huynh, Chemistry (M)

Malate dehydrogenase 1 (MDH1) catalyzes the reversible NADH-dependent reduction of oxaloacetate to malate in the cytosol, helping drive glycolysis by generating NAD+. As many cancers rely in increased rates of glycolysis to fuel the metabolic needs of rapidly proliferating cells, MDH1 has been recently proposed to be important in fueling cancer metabolism. In non-small cell lung carcinomas (NSCLC) in particular, MDH1 is amplified and is associated with poor prognosis. These findings suggest MDH1 may be a potential therapeutic target. However, knowledge of MDH1's kinetic mechanism is limited. Here we propose to generate a robust heterologous expression and purification strategy to generate purified MDH1 for kinetic study. We have assessed the role of incubation time, temperature, the concentration of inducing agents, and other factors to determine the optimum conditions. Ultimately, we will perform kinetic assays probing the effects of pH and oxygen stress on both forward and reverse reaction. This work will provide a critical foundation for understanding the role of MDH1 activity in the tumor environment.

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453 2:15 pm R

Noninvasive Kinetic Monitoring of Response to Targeted Therapy using Circulating Tumor DNA in Non-Small Cell Lung Cancer Patients

Setareh Akhavan, Public Health (U)

Background:

A non-invasive technique to detect tumor response from targeted therapies is a desirable approach to improve methods

of precision oncology. Resistance with the epidermal growth factor receptor (EGFR) T790M mutation can be acquired after treatment of first generation anti- EGFR inhibitors. Biopsies are often difficult for relapsed patients, expose risk, and can be costly. A non-invasive method to detect mutations in real-time would be helpful. Analysis of circulating tumor DNA (ctDNA) in urine samples of patients was used to determine the dynamics of response to treatment with third generation anti-EGFR therapy.

Objective:

To determine the concordance between blood and urine and test the hypothesis that early dynamics of T790M mutational load in ctDNA within the first week to provide insight into tumor biology and predict radiographic response to therapy with second and third line anti- EGFR tyrosine kinase inhibitors.

Methods:

12 patients were tested for ctDNA in the urine; of those 12 patients, four were tested for ctDNA in the blood. Urine specimens were collected from patients prior to treatment, daily for 1 week, then weekly for 3 weeks, then monthly. Blood specimens were collected from patients prior to treatment, 1 week after treatment, then during follow up. DNA electrophoresis was performed on urine samples using high sensitivity DNA assay version 1.03 by Agilent Technologies. Probes were manually placed at 35 base pair for the lower marker and 10,380 base pair for the upper marker. DNA that was greater than 35 base pairs and 150 base pairs or less has been evaluated to have circulating tumor DNA. For each time point, the total concentration of DNA within these limits were then calculated.

Results:

Among patients who showed a drop in the concentration of ctDNA in urine samples, we were able to see concordance with molecular response in blood and CT response by RECIST criteria. In patients who were not molecular or CT responders, we saw a corresponding increase in concentration of ctDNA.

Discussion:

The urine samples express the drop in mutation load, and the analysis of ctDNA in the blood samples shows the drop in T790M and other activating EGFR mutations. This novel approach facilitates the assessment of longitudinal ctDNA variations in the blood and urine during treatment with tyrosine kinase inhibitors to provide insight into response. The size properties of ctDNA can be helpful to increase yield for those fragments which may harbor oncogenic mutations.

454 2:15 pm S

Investigating Super Enhancer MICAL2's Potential Role In Pancreatic Cancer Oncogenesis

Julia Escobedo, Biology (General) (U)

Background: Pancreas cancer is the third leading cause of cancer related death in the United States, and is projected to be the second leading cause by 2030. The high mortality rate is due to both intrinsic resistance to traditional cancer therapies and a lack of early detection tools. Super-enhancers are large portions of the non coding genome characterized by clusters of transcription factors that drive the expression of genes associated with cell identity. The Lowy lab hypothesized that super enhancer associated genes may represent novel therapeutic targets. As such, they screened pancreas cancer and normal pancreatic tissues for differentially expressed super-enhancer activity. MICAL2 (Molecules Interacting with CasL) was identified as a highly differentially expressed super-enhancer tagged gene. Preliminary studies revealed that loss of MICAL2 expression inhibited pancreatic cancer cell colony formation and we therefore hypothesized that MICAL2 may regulate cell proliferation. Methods: To assay for cell proliferation, we employed a 96 hour colorimetric assay using Calcein AM in the setting of MICAL2 shRNA knockdown in AsPC1 cells. A plate reader was used to measure relative fluorescent units (RFU) which is directly proportional to the number of viable cells in the populations respectively. Results: After 24 hours of growth, the difference between MICAL2 knockdown and parental was measured to be 1,069 viable cells. At the 72 hours mark the difference in viable cells between the populations more than doubled to a difference of 2,508 cells. The parental AsPC1 cell line at every time point consistently had a higher amount of viable cells, indicating inhibiting MICAL-2 knockdown reduced pancreatic cancer cell proliferation. Conclusion: MICAL-2 is a super enhancer associated gene in pancreatic cancer. MICAL2 regulates pancreatic cancer cell proliferation and therefore represents a promising therapeutic target in this disease.

Session D-12

Poster Biological and Agricultural 8
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

455 2:15 pm T

The bHLH factor E47 downregulate oncogenic c-MYC in pancreatic cancer through epigenetic modifications

Xiuyuan Cheng, Biology (U)

Dysregulation of c-MYC is a key factor in the malignant transformation of pancreatic ductal adenocarcinoma (PDA). Recent studies have shown: high levels of MYC drive down expression of bHLH transcription factor, E47 in the pancreas. Moreover, the most common mutations in noncoding regions are binding sites of E47 and its homologs suggesting this protein may serve a tumor-suppressor role in pancreatic cancer. Consistent with this, our data indicate that restoring the transcriptional activity of E47 can induce growth arrest in PDA cells by downregulating the number of MYC RNA transcripts. To better understand the molecular mechanism of this reciprocal relationship between MYC and E47, we performed ATAC-seq (Assay for Transposase-Accessible Chromatin using sequencing). One finding is that the chromatin accessibility around E47 enhancer regions is diminished during pancreas pathogenesis. In contrast, chromatin accessibility of a discrete

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regulatory element near the 3' end of MYC locus is elevated in cancerous cells compared to pre-cancerous cells, and this corresponds with the increased amount of MYC transcripts in cancer. Remarkably restoration of E47 activity in pancreatic cancer reduced the chromatin accessibility of the regulatory element in the MYC locus. Thus, we hypothesize that E47 is acting as a tumor suppressor by downregulating MYC transcription through epigenetic modifications. Further efforts we want to further investigate the functional interplay between E47 and MYC during the progression of pancreatic cancer.

456 2:15 pm U

Expression and purification of the Drosophila melanogaster (Dm) IKKß:γ complex

Samantha Cohen, Chemistry (D)

In Drosophila, the IMD pathway is indispensable for proper innate immune responses. Infection by gram-negative bacteria elicits a signaling cascade culminating in the rapid induction of antimicrobial peptide gene expression by the NF-κB transcription factor Relish. Signal-dependent activation of Relish is an essential component in the IMD pathway and is regulated by the catalytic activity of the Drosophila melanogaster IκB Kinase (DmIKK) complex. DmIKK is composed of two subunits: the catalytic subunit IKKβ and non-catalytic subunit IKKγ. Like many protein kinases, DmIKK must be activated for proper catalysis. Although there has been extensive research into the signaling pathways of the Drosophila innate immune response (including 2011 Nobel prize-winning work awarded to Jules Hoffmann), little is known about the molecular mechanisms that lead to DmIKK activation. Here, we report the optimization of large-scale expression and purification of the DmIKK complex. Utilizing the baculovirus expression system in insect cells, we have isolated highly-pure recombinant DmIKK complex (~2 mg per 100 mL of cultured Sf9 cells) for structural and biophysical studies aimed at understanding its mechanism of activation.

457 2:15 pm V

Synthesis of Chiral Sulfoxides and Separation of Enantiomers by HPLC method

Sopiko Maglakelidze, Chemistry/Biochemistry (U)

Chlorpromazine, also known as Largactil and Thorazine, belongs to the class of drugs called phenothiazine antipsychotics. It is used to treat mental illnesses such as schizophrenia, manic phase of bipolar disorder, severe behavioral problems etc. It works by antagonizing dopamine D2 receptors in brain, depressing release of hypothalamic and hypophyseal hormones, may also depress reticular activating system. Despite a lot of advantages this drug has a lot of side effects. Due to this fact we decided to see if its monoxide would have any different effect on the human body. For the oxidation we have used 77% m-CPBA, 1:1 ratio with chlorpromazine to avoid formation of dioxides. For the same reason reaction was carried out in an ice bath at the temperature of 0oC. In order to avoid oxidation of N atom we have preserved it with HCl to decrease nitrogen's reactivity. To check the progress of the reaction we have used TLC (CH2Cl2:CH3OH). Using this method we also checked the product after its cleaning. In order to make sure what compound was delivered after the reaction and whether we got enantiomers, we have sent it to IR and NMR and the results were satisfying. We have gotten pair of enantiomers due to oxidizing of sulfur atom. After checking the effect of the new compound on the human body it was revealed that new enzymes were added to the target classes.

458 2:15 pm W

Structural basis of 7-deazaguanine modification of DNA in bacteria and phage

Eric Hellie, Chemistry (U)

Two important modifications of tRNA, the 7-deazaguanine nucleosides queuosine (Q) and archaeosine (G+), are biosynthesized from GTP in bacteria and archaea, respectively, in a well characterized multi-enzyme pathway leading to the shared advanced intermediate, 7-cyano-7-deazaguanine (preQ0). In bacteria, preQ0 is converted to an aminomethyl derivative that is then inserted in tRNA by the bacterial tRNA-guanine transglycosylase enzyme. In archaea, preQ0 is inserted directly in tRNA by the archaeal TGT before conversion to G+. Recently, in 230 bacterial and phage genomes, a genomic island that contains a paralog of TGT was identified, which led to the discovery of Q, G+ and preQ0 deoxy derivatives in the DNA of some of these organisms. This gene cluster was renamed DpdA-K, for "7-deazapurine in DNA." The G+-modified DNA of E. coli bacteriophage 9g has been shown to resist restriction by >140 Type II restriction endonucleases (REases), consistent with a role of the modification as a defense mechanism. Recent experiments have shown that Salmonella Montevideo DpdA (SmDpdA) is a DNA-guanine transglycosylase that catalyzes the insertion of preQ0 into DNA with the help of DpdB. Here we report the crystal structure of SmDpdA determined at 2.25-Å resolution by multi-wavelength anomalous diffraction methods, and a docking model of its complex with DNA that informs future crystallization of the nucleoprotein complex. Further, we report high-throughput crystallization of phage 9g DpdA using the vapor-diffusion method. The results provide structural insight into the molecular mechanisms underlying hypermodification of DNA, and a path for future structural analysis of the deoxy-7-deazapurine pathway.

459 2:15 pm X

Inhibition of Neisseria gonorrhoeae GTP cyclohydrolase type IB

Ryan Murphy, Cellular and Molecular Biology (U)

The GTP cyclohydrolase type I enzymes catalyze the first step in the biosynthesis of folic acid in bacteria and plants, biopterin in mammals, and the 7-deazaguanine modified nucleosides in

bacteria and archaea. The structure of the bacterial-specific GTP cyclohydrolase type IB enzyme (GCYH-IB) is distinct from that of the canonical type IA enzyme (GCYH-IA) found in mammals, and crystal structures of the two enzymes in complex with the potent inhibitor 8-oxo-GTP reveal substantial differences in inhibitor mode of recognition. These differences, combined with the essentiality of GCYH-IB in some pathogenic bacteria, present it as an attractive antibacterial drug target. We hypothesize that these differences can be exploited in the design of inhibitors specific for the GCYH-IB enzyme. Here, we report relative inhibition data of human GCYH-IA and Neisseria gonorrhoeae GCYH-IB with three designed compounds G2, G3, and S-G3, and comparison to inhibition with 8-oxo-GTP. We also report kinetic inhibition parameters for compound G3 against both enzymes. While 8-oxo-GTP remains the most potent inhibitor tested, its low selectivity for the bacterial enzyme makes it a poor drug candidate. In contrast, the structure-based inhibitor G3 exhibits the highest selectivity for GCYH-IB, promising further development. Finally, ongoing crystallographic analysis of the enzyme-inhibitor complex is discussed.

460 2:15 pm Y

Overexpression, Purification and Crystallization of the Queuine Salvage Protein DUF2419

Kevin Zarghan, Cellular and Molecular Biology (U)

Queuine is a modified nucleobase that is biosynthesized de novo in many bacteria and archaea. It is uptaken by eukaryotes where it acts as a precursor of the modified nucleoside Queuosine (Q), found at the wobble base of cytoplasmic and mitochondrial tRNAs that incorporate Tyr, Asp, Asn and His amino acids. In human, queuine is exclusively retrieved from the ingested food and microflora and is subsequently inserted in human tRNA by the human tRNA-guanine transglycosylase enzyme. Queuine is the only micronutrient that directly affects efficiency and accuracy of translation of mammalian proteins, with roles in metabolism and healthy-aging of the brain. It is required for the biosynthesis of BH4, a vital cofactor for numerous enzymes in the body, including those involved in the formation of the amino acid tyrosine, and the key neurotransmitters dopamine and serotonin. Recently, DUF2419 was identified as a protein family involved in queuine salvage in eukaryotes, and the human homolog C9orf64 was shown to play a similar role. The observations that C9orf64 is deleted in cases in Acute Myeloid Leukemia, and its promoter region is methylated in breast cancer cell lines, point to a link between Q metabolism and cancer in humans. Consistently, levels of Q-modified tRNA have been long-known to correlate with tumor aggression. Although, the exact biochemical function of DUF2419 remains unknown, its predicted structural similarity to 8-oxoguanine-DNA glycosylase, which cleaves oxidized guanines in DNA, suggests a ribonucleos(t)ide hydrolase activity to liberate the modified nucleobase from its nucleos(t) ide precursor. We are testing this hypothesis through a combination of structural and biochemical methods. Here we report the overexpression and purification of human and bacterial DUF2419, and initial crystallization of these proteins toward crystal structure determination.

Session D-13

Poster Biological and Agricultural 9
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

461 2:15 pm Z

Bacteriahemerythin (BHr) function in Methyltuviomicrobium alcaliphilum (20ZR)

Monica Bermudez, Biology (U)

Methane is the second most abundant greenhouse gas. Reducing the atmospheric levels of methane could potentially lower global temperatures. One way to achieve this is by utilizing methanotrophic bacteria which use methane as a sole carbon and energy source either aerobically or anaerobically. Our focus is on aerobic methane oxidation that requires the enzyme methane monooxygenase (MMO). The enzymes convert methane and oxygen to methanol, and thus its activity depends on both CH4 and O2. While some methanotrophs are capable of methane oxidation at very low levels of oxygen very little is known about oxygen cycling in the bacteria. Studies from Kao et al identified a homologue of hemerythrin in Methylococcus capsulatus (McHr). It has been proposed that McHr delivers oxygen to pMMO for methane oxidation (2008). We hypothesized that the overexpression of BHr will increase the methane consumption in Methylotuvimicrobium alcaliphilum 20ZR, a methane-consuming bacterium with high biotechnological potential. We used genetics tools to construct a set of mutants: (a) BHr knockout strain of 20ZR by using pCM184, a suicide allelic exchange vector; and (b) strain of 20ZR overexpressing BHr by using pAWP78-Ptac system. The mutants were then compared to the wild type strain and the strain harboring empty pAWP78 plasmid. Initial data suggest that 20Z-BHr does not contribute to methane oxidation directly. We continue the experiments by culturing them in parallel at oxygen to methane ratios of 5:5 and 3:5 in a DAS box mini bioreactor system having automated temperature, pH, and dissolved oxygen controls. It is also equipped with a sample port for measuring optical density.

462 2:15 pm AA

Understanding the Effects of Vessel Mooring Disturbance on Rhodolith Photosynthetic Production

Dillon Dolinar, Biology (Emphasis Zoology) (U)

Rhodoliths are red coralline algae that are found in a broad geographic range and can be found widely throughout the world's oceans in places ranging from the Arctic to southern Australia (Harris et al. 1996). They serve a variety of important ecological roles such as acting as transitional habitat between rocky and sand areas and more importantly, they provide stable, three-dimensional habitat for a diverse range of organisms from other algae to small vertebrates to burrowing fish (Foster et al. 2013). Our experiment seeks to understand

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the effects of human disturbance on rhodolith physiology. Mooring networks are built over multiple rhodolith beds on Santa Catalina Island which results in crushing of the benthos by mooring chains and spanner lines. We aimed to see if the human disturbance of crushing alters photosynthetic production and respiration of rhodoliths. In this experiment, we tested photosynthesis and respiration of intact undisturbed rhodoliths, recently disturbed rhodoliths, and rhodoliths that had been previously disturbed. This was done by monitoring the temperature and amount of oxygen in a closed bottle system containing a rhodolith. We would monitor the system for fifteen minutes while it was covered entirely allowing no light to reach the rhodolith. We observed a gradual decrease in oxygen in the system due to only respiration taking place. After fifteen minutes, we would then shine a bright light onto the rhodolith allowing photosynthesis to occur. Here we observed an increase in oxygen in the system due to photosynthesis. Each individual rhodolith was given two fifteen-minute periods of dark and light. We ran other trials with invertebrates and fleshy to estimate their respiration and production to better understand oxygen flux in this ecosystem.

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463 2:15 pm BB

Through the Looking Glass into the Catalina Island Rhodolith Infaunal Microcommunities

Natalie Goetz, Marine Biology (U)

Rhodolith beds are comprised of free-living coralline red algae that host a myriad of microorganisms. On Santa Catalina Island, rhodolith beds are located in shallow bays that are also popular boat mooring fields, especially during the summer months. The mooring chains in these fields crush rhodoliths and disturb their structure, creating areas of crushed rhodolith sand. This study addresses how rhodolith bed infaunal microcommunities are altered as a result of being crushed by these moorings. In efforts to better understand community resilience and alteration from chains that readily crush these fragile algae, we must first understand the associated microfauna diversity in these extensive beds. To do this, a 5 cm diameter by 10 cm tall core was used to obtain infaunal samples in undisturbed and disturbed rhodolith beds at at each site (n=4 per habitat per site). Following core extraction, excess water was sieved off in the lab and the cores were frozen for later sorting at San Diego State University using microscopes. Invertebrates found in each core were then separated by lowest known taxonomic ranking and separated into their corresponding disturbed and undisturbed regions. An abundance of invertebrates were found both in disturbed and undisturbed rhodolith beds; however, microinvertebrate diversity and density was found to be higher in areas of live rhodoliths, indicating a loss of diversity from these mooring chains.

464 2:15 pm CC

Determining the presence of phage-encoded diphtheria toxin gene in the environment

Thelmalyn Montenegro, Biology (U)

Toxins released into the environment by bacteria are known as exotoxins and are the main cause of many human diseases. Exotoxin genes are transmitted via bacteriophage, mobile DNA elements that allow genes to move between different environments and infect bacterial hosts. The process of rapid horizontal gene transfer explains why these exotoxin genes are prevalent in the environment. Additionally, global climate change has a significant role in bacterial contamination. Among the several different exotoxins that exist, the diphtheria toxin (DTX) from the host Corynebacterium diphtheriae is being studied here. This bacterium is associated with respiratory diseases, which are problematic in developing countries. The purpose of this study is to determine the prevalence of the phage-encoded dtx gene in environmental samples collected off of the San Diego coast. Water, sediment, and soil samples were collected from different environments and analyzed with PCR assays. The results in this project so far have shown no detection of the dtx gene. The hypothesis is neither correct nor incorrect as further experiments need to be conducted to obtain a standard for testing samples. Steady progress is being made to determine the methodology of phage-encoded dtx in pathogen evolution.

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465 2:15 pm DD

Presence of Phage-encoded ctx Exotoxin Gene in Aquatic Samples Collected off the San Diego, CA Coastline During an El Nino Event

Tiana Silver, Microbiology (U)

Exotoxins are proteins that can be found in pathogenic bacteria that cause many human diseases. The exotoxins are produced within bacteria that have acquired the gene from interactions with bacteriophage (phage)--viruses of bacteria. As major predators of bacteria in the environment, phage can integrate their genome into their bacterial hosts through lysogeny--lysogenic conversion. When the integrated gene is a virulent gene like the cholera toxin (ctx) gene, this can convert an innocuous bacterium into a pathogen. As the most abundant organisms in the environment, it is important to track these phage-encoded exotoxin genes to gain insight into the genetic interactions that could lead to the evolution of novel human pathogens. One example of a phage-encoded exotoxin gene is the gene for the cholera toxin (ctx) of the bacterium Vibrio cholerae. In previous studies, our lab has identified a reservoir of phage-encoded exotoxin genes in the natural environment. The current project examined environmental samples collected during a longitudinal study comparing the presence and distribution of phage-encoded exotoxin genes during the wet and dry seasons in San Diego. These samples were collected near shore from Imperial Beach to Scripps Institute of Oceanography in La Jolla from January 2016 to

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January 2017. Exotoxin-specific PCR assays for the ctx gene were performed on these samples. Screening of close to 100 samples from water and sediment showed that the ctx gene was present in many of the samples tested. Many of the samples where the ctx gene was detected also contained the phage-encoded shiga toxin (stx) gene of Escherichia coli. The presence of multiple phage-encoded exotoxin genes in these environmental samples is not surprising and mirrors previous results, suggesting that the impact of human waste on the environment following precipitation events is significant and multifactorial. These results suggests the importance of global climate change on increased presence of human waste-associated bacteria and their corresponding phage-encoded virulence genes.

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466 2:15 pm EE

Optimizing the efficacy of pulsed 450 nm light on bacteria through correlation with fluorescence spectroscopy

Paulina Cortez, Biology (U)

The increasing burden of multiple drug-resistant bacteria underscores the need to find innovative therapeutics for bacterial infection. Current protocols involve irradiation with continuous wave blue light at different time intervals and with different fluences. Our team is currently using pulsed blue light to suppress bacterial growth and optimizing this protocol by utilizing changes in fluorescence intensity during and after blue light exposure and correlating irradiation interval with maximum bacterial suppression. Spectroscopic data of Propionibacterium acnes correlated with the three-hour time interval frame, which corresponds with timely “depletion and replenishment” of photosensitizers. Both bacterial survival and fluorescence intensity data supports our hypothesis that irradiation of P. acnes with a fluence of 7.6 J/cm2 at three-hours interval produces maximum bacterial suppression. Fluorescence emission spectra of the not so susceptible Escherichia coli and Group B streptococcus revealed minimal intensity at various wavelengths which is indicative of the minimal bacterial suppression observed. Even so, the fluorescence intensity data correlates with the increased bacterial suppression observed after irradiation with 7.6 J/cm2 three times a day at thirty-minutes interval respectively.

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467 2:15 pm FF

Comparing effects of payments for ecosystem services programs on species richness over time and space

Alexandra Yost, Geography (M)

Payment for ecosystem services programs (PES) pay landowners to maintain and improve ecosystem services such as water infiltration, carbon sequestration, and biodiversity. Incentives to reduce impacts on local environments are especially useful in rural and developing areas because locals rely on the land for a subsistence lifestyle that often requires resource collection and farming. I hypothesize that PES programs may have positive impacts on species richness even if biodiversity is not a direct goal of the PES program. This project will utilize camera trapping data and remote sensing imagery to inform a multi-species hierarchical model to estimate: species richness, environmental characteristics of preferred habitat of wildlife, the effect of human disturbance and land enrolled in PES program on wildlife occurrence. A previous multi-species hierarchical occupancy model was created with the same data collection methods in the study area using data from 2015 and 2016. I will incorporate new data from 2016 and 2018 into the model to compare the results of my model and the previous model to infer any changes in species richness or impact of human disturbances over time that may be attributed to the PES programs. Such changes may be helpful to investigate the effectiveness of two PES programs ongoing in the study area in terms of promoting biodiversity. I will also add more variables into the existing model to represent additional environmental characteristics and human disturbances. By adding data to increase the temporal scale of the model and new variables that are potentially influential, I expect to corroborate findings regarding habitat selection, impact of human disturbances, and overall species richness, but predict an increase in species richness in or near the PES land and a lesser impact of human disturbance on species richness in or near the PES land (as PES land will be less utilized by humans and more tree cover will exists compared to previous cropland). By expanding on previous work, this study will provide more knowledge of wildlife interactions as well as a model and data collection techniques that can be applied to other areas of China with similar social and environmental characteristics.

Session D-14

Poster Physical and Mathematical Sciences 10
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

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468 2:15 pm GG

Reactivity of Imidazole Substituted Biaryl Mono-Phosphine Complexes

Hanne Henriksen, Chemistry (U)

Organometallic reactivity is heavily influenced by the environment created through ligand coordination to the metal. A series of imidazolyl substituted biaryl monophosphine ligands have been synthesized for use in transition metal catalysis. The rigid biphenyl scaffold provides a means for restricting conformation and unique placement of a pendent Lewis basic group in the secondary coordination sphere. Coordination of these ligands to form gold complexes have proven to be useful for alkyne addition reactions. Computational analysis supports the idea that transition metal complexes containing these new ligands can act bifunctionally in reactions that involve proton transfer or hydrogen bonding.

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Coordination chemistry and reactivity of late transition metal complexes of these new ligands will be discussed.

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469 2:15 pm HH

Toward (Z)-Alkene Isomerization

Esteban Delgado, Chemistry (U)

The Grotjahn lab has developed two catalysts that contain a cyclopentadienyl (Cp) ligand as well as a phosphine ligand. These catalysts are highly selective in the production of (E)-alkenes from terminal alkenes. We hypothesize that the high (E)-selectivity originates from the bifunctionality of the phosphine ligand. A potential approach to inducing (Z)-selectivity is to modify the Cp ligand by incorporating bulkier R groups and including a pendant base. Methodologically, we are conducting water and air free synthetic experiments to produce altered Cp ligands. These ligands are characterized by nuclear magnetic resonance and recrystallization, purified by silica gel column chromatography, and subsequently attached to ruthenium metal centers by oxidative addition in water and air free synthetic experiments. The consequent ruthenium complexes are tested for (Z)-alkene isomerization efficacy through iterative nuclear magnetic resonance experiments. Currently, the results of our experiments have yielded a small variety of Cp ligands with one ligand being novel. In addition, a novel ruthenium complex has been synthesized, but has not been tested for any (Z)-alkene isomerization potency, as it is not pure and thus not ready for that step in our protocol. In summary, the synthesis and characterization of functionalized cyclopentadienyl ligands and a respective ruthenium complex will be presented.

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470 2:15 pm II

Silicon Quantum Dots: A General Photocatalyst for Activation of Tertiary Amine

Yue Sun, Chemistry (M)

It is highly desirable to explore silicon materials in organic photocatalysis fields as it shows intense photoluminescence character with physical dimension less than 4nm. Here we demonstrate a direct way to produce alkenyl passivated silicon quantum dots (~2.62m), which provides chemical stability and the effective band gap of silicon particle. The passivated silicon QDs have an ability to selectively photocatalyze organic reaction, e.g. cyclization of pyrazole and pyrrole, activation of tertiary amine under visible light illumination. Scribing silicon materials with reactive media reagent displays resistance to high polarity solvent, a long tail absorption and a broad range of emission etc. Those advantages make silicon QDs have a great potential use in reactions using harsh conditions. Silicon materials applied into organic reaction is creative way, however, investigation involved into this field is still rare. Our economic, easy-to-proceed, efficient silicon QDs photocatalyst is expected to bring a new insight in chemical synthesis.

471 2:15 pm JJ

Lead-halide Perovskite Nanocrystals as Efficient Photocatalysts for Pyrazoles and Pyrroles Synthesis

Yixiong Lin, Chemistry (D)

Pyrazoles and pyrroles are two important biological and pharmacological species, they are extensively used in medicine. Therefore, it's significant to find an efficient way to synthesize, particularly under mild condition and function group tolerance. Conventional photocatalyst systems suffer from deficiencies, such as difficulties in synthesis due to their complicated ligands, prohibitive cost because of the noble metal center and harsh reaction conditions in which they usually need to perform high temperature and under the protection of inert gas. Herein, we report an easily-synthesized, economic perovskite CsPbBr3 photocatalyst to catalyze the tandem reaction of α-bromo ketones with hydrazones or enamines to afford 1,3,5-trisubstituted pyrazoles or 2,5 diaryl-substituted pyrroles. This type of reactions is processed under visible light illumination and their target products are in good to high yields. Our economic novel perovskite CsPbBr3 photocatalyst can not only tolerate several types of substituted substrates, but also can be processed in mild conditions (in air, at room temperature, under sunlight). Such properties are highly desirable in nowadays organic synthesis. Meanwhile, with its bandgap-tunable property, we foretell that our perovskite CsPbBr3 photocatalyst will play a key role in future organic synthesis.

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472 2:15 pm KK

Laser Photochemistry of Hydrocarbon Free Radicals

Karan Doppalapudi, Chemistry (U)

The experiment we are conducting is to determine the chemistry of intermediates formed during hydrocarbon combustion reactions. By studying intermediate hydrocarbon radicals formed during combustion reactions, we can acquire a better understanding of how to make such reactions more efficient and viable. In our experiment, we use a substituted hydrocarbon chain that will easily generate a radical upon excitation by a UV Neodymium YAG laser. The Continuum Surelite laser being used will emit pulses at 266nm well within the ultraviolet (UV) band that resides in the 10-400nm range. Although this wavelength is invisible to the human eye, discoloration of samples can be seen. This indicates a chemical change within the sample itself upon photolysis by the laser. Under carefully curated conditions, the highly reactive intermediate compound reacts with a quencher molecule such as methyl iodide to form products. We will be studying radical intermediates that can isomerize without bond-breaking, and looking to see if branching of the reaction can be observed -- if different products are seen corresponding to the different isomers of the radical intermediate. The products will be structurally characterized by spectroscopic methods utilizing a Nuclear Magnetic Resonance (NMR) spectrometer, and perhaps other spectroscopic methods will be useful as well. A more comprehensive knowledge of combustion reactions will

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lead to improvements in our ability to understand and control this complex chemical process.

Session D-15

Poster Behavior and Social Sciences 16
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

473 2:15 pm LL

Lessons Learned from an Interprofessional Collaboration: Examining Parent Child Interactions During Shopping

Isabella Bareiss, Speech Language and Hearing Sciences (M)

Community Based Research (CBR) is a collaborative approach to research in which researchers partner with the community to solve real world

problems. Interprofessional Practice (IPP), incorporates the patients, their families, and communities, along with healthcare professionals, to best provide care for the individuals. The goal of the proposal is to define CBRIPP in the context of a collaboration focused on health. We aim to spark a discussion among researchers and clinicians on how to improve health outcomes for children, specifically childhood obesity, using a CBRIPP model. To that end, we will provide a brief overview of CBR and IPP. Then, we will profile the portion of the project led by speech language pathology clinical researchers, highlighting the research methodology as it relates to CBR and IPP, levels of community engagement, benefits to varying stakeholders, lessons learned, and next steps for planning an intervention. In a collaboration with marketing, public health, and speech language pathology faculty and students, the interaction patterns between 75 parent child dyads of Latino communities while grocery shopping were analyzed. Eyetracking, video, and audio data collected as parent-child dyads engaged in grocery shopping. Audio data was transcribed by REV (Chicola, 2011) with an additional pass completed by trained transcribers. Transcribed samples are currently being coded and analyzed (facilitated by Systematic Analysis of Language Transcripts software, SALT; Miller & Iglesias, 2006). Samples are being coded for patterns such as: number of utterances, number of different words spoken, initiation of topic, child requests for an item, parental rejections of an item, directives influencing child behavior, prohibitions of child behaviors, parental affirmations, use of brand names, and directions of product cost. These patterns can then be used for future research in linking grocery shopping habits with purchases and resulting health outcomes.

474 2:15 pm MM

Word Learning Strategies in Children With and Without Language Disorder

Ariana Arakelian, Speech Language and Hearing Sciences (U)

Children with Developmental Language Disorder (DLD) have difficulty learning and using language while maintaining normal cognitive abilities. One well-established deficit is in learning new words although we have limited understanding of the strategies children with DLD use during word learning.

This study examined the types of word learning errors made by both typical developing (TD) children and children with DLD to identify strategies used during word learning. The ultimate goal of this research is to guide appropriate treatment necessary for word learning.

Methods: Participants in this study included 26 (13 DLD, 13 TD) right-handed monolingual English children aged 8-13. The two groups were equivalent in age and nonverbal cognition and group assignment was based on language assessment performance. All participants completed a World Learning from Context task where they listened to sets of three sentences in which the final nonsense word was a target novel word to be learned. The sentence triplets comprised two conditions: Meaning, in which triplets were designed to establish a meaning for the novel word, and No Meaning, which was a control for repetition. Each triplet was followed by a question, “What does the word mean?”. Child responses were coded in two different ways: 1) related to the sentence the response best matched and 2) related to the target response. This study focuses on the Meaning condition.

Results: For coding type 1, both groups’ non-target responses primarily matched best with the first sentence in the triplet. The DLD group provided more responses that fit with the third sentence compared to the TD group. For coding type 2, both groups provided non-target responses that were primarily within the same lexical category as the target response. These findings support the idea that difficulty for both TD children and children with DLD lies within extended mapping and decontextualizing a new word rather than fast mapping and categorization. Based off of these findings, effective treatment would include a thorough explanation of a newly learned word described in multiple contexts allowing the child to succeed in cross-situational word learning.

475 2:15 pm NN

White matter pathways supporting speech monitoring after stroke

Alyssa Zidek, Speech Language and Hearing Sciences (U)

Patients with brain lesions in the left temporal lobe are often unaware of their speech errors, while patients with brain lesions in the left frontal lobe are usually consciously aware of their speech errors. These findings along with previous research conducted in our lab has led us to hypothesize that preserved white brain matter pathways between the left temporal cortex and the medial frontal cortex, are necessary for speech monitoring mechanisms. This study focuses on analyzing behavioral data gathered during a naming task in patients with stroke-induced lesions in the left hemisphere and on tracking white matter brain pathways using diffusion-weighted magnetic resonance imaging (dwMRI). We conducted dwMRI and behavioral testing on a total of 10 patients, and compared their behavioral results to those of 7 age-matched controls.

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

Our results show that patients made significantly more errors than controls when naming pictures. However, we also found sizable inter-individual variability within the patient group in terms of reaction times and error rates. Preliminary investigations suggest one of the factors contributing to this variability is lesion location. Indeed, damage in the internal capsule of the left hemisphere seems to be associated with large error rates. Several key white matter pathways linking the left temporal lobe to the left frontal lobe are known to pass through this bottleneck region. We are conducting further processing on the dwMRI images in order to understand which specific tract(s) may be critical to support speech monitoring. Our findings could potentially help predict which patients with stroke-induced brain lesions would show speech monitoring impairments, and would therefore allow the patient's speech-pathologist to focus on this impairment in speech therapy sessions. The findings of this study therefore have the potential to advance the understanding of the neuroanatomy of speech monitoring overall and improve our understanding of deficits associated with stroke-induced aphasia, in addition to improving clinical practice.

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476 2:15 pm OO

Lexical Quality Variables in Deaf and Hearing Populations

Madison Trussell, Speech Language Hearing Science (U)

We investigated the differences in lexical quality variables between deaf readers (n=73) and hearing readers (n=67). Variation in lexical quality representations – orthography, phonology and semantic – has consequences for reading comprehension. We evaluated the relative contribution of these representations to reading comprehension in deaf and hearing readers to predict the outcome of two reading comprehension measures (PIAT, Woodcock Johnson). Our results indicated that phonological skill predicted reading comprehension in hearing readers. However, for deaf readers, semantics and orthography, not phonological knowledge, significantly predicted reading comprehension. We hypothesized that adult deaf individuals, who are accomplished readers and use American Sign Language to communicate, have weaker sound-to-letter representations, but may form stronger connections between orthography and semantics instead in order to achieve good reading comprehension. Further, the hearing participants outperformed the deaf on the phonological task performance, but achieved similar results on shallow orthographic tasks that do not rely on phonological awareness. Both deaf and hearing participants scored similarly on the semantic task and orthographic task. Our results demonstrate that deaf children who are raised using sign language may not need overt phonological instruction to attain proper reading skills. Rather than phonological instruction, the focus could be placed on spelling and word knowledge for better reading acquisition. In addition, all participants also completed a reading questionnaire, which gathered information about the participants' reading experiences and reading habits. Preliminary results suggested that deaf readers reported reading more often for pleasure than the hearing readers, but both groups reported similar amount of reading enjoyment. Interestingly, deaf participants reported that their parents read less often with them when they were children than the hearing participants. Further to this, the amount of parental reading input correlated positively with reading comprehension in the deaf group only. This raises a question about the importance of early reading input for literacy outcomes.

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477 2:15 pm PP

Slow Speech Movements in People With Parkinson's Disease With and Without Deep Brain Stimulation

Cassidy Childers-Reid, Speech, Language, and Hearing Sciences (U)

By 2020 Parkinson's Disease will affect almost 1 million people in the US. Although the causes are unknown, it is a neurodegenerative disorder stemming from cell death in the substantia nigra of the basal ganglia. This movement disorder causes reduced mobility, limb rigidity, and balance issues. It also affects speech movements for this population. Individuals with Parkinson's Disease typically have hypokinetic dysarthria, which is a speech disorder characterized by reduced intelligibility, faster speaking rates, imprecise articulation, reduced loudness, reduced pitch and loudness variability. Kinematic studies have shown that this is caused by reduced mobility of the jaw, lips, and tongue. Deep brain stimulation (DBS) is a new technology that uses electrodes to deliver electrical pulses to certain brain cells. This treatment has shown improvements for reducing motor symptoms such as tremors and stiffness. However, its effectiveness in treating speech varies as some individuals showed better intelligibility while others remained the same or worsened. Previous treatment methods have shown that speaking at a slower rate has increased intelligibility. The research questions for this study are: Will DBS increase speech movement in individuals with parkinson's disease in comparison to participants without DBS speaking at a habitual rate? Will speaking at a slower rate increase speech movement in comparison to habitual rate? In this study, we compared 3 groups which included Parkinson's Disease, Parkinson's Disease with DBS, and a healthy control each with 9 participants. Each group repeated the phrase "Buy Bobby a puppy" 10 times in their habitual rate and again in half the speed of their normal speaking rate. Participants in the DBS group completed the task with DBS on and DBS off for both normal and slow speech. Using the optical motion capture camera, we measured speed, displacement, and duration by tracking the 15 markers on the face to record lip and jaw movement. Multilevel models with participants on the repeated statement will be used to determine how DBS state (ON, OFF), Task (habitual, slow) and Group (DBS, Parkinson's disease, healthy control) affect lip and jaw speed, displacement, and duration.

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

478 2:15 pm QQ

Interindividual variability in the brain dynamics associated with word retrieval as revealed by intracranial electroencephalography

Tiffany Duffy, Speech Language and Hearing Science (U)

When a visual or auditory stimulus representing an object is presented to a person it takes time for a person to take in that stimulus, process it, retrieve the correct word to name the object, and then speak the word. Theoretically, similar brain regions should be involved in word retrieval and production independent of the stimulus modality. In this study, we analyzed intracranial electroencephalographic (iEEG) data recorded while 9 patients named objects represented by pictures or environmental sounds (e.g., if the visual stimulus presented was a picture of a cat or if the stimulus was a cat's meow, then the patient would say "cat"). Intracranial EEG offers unique excellent spatial and temporal resolution allowing to examine the times at which brain areas were active for word retrieval for visual and auditory stimuli. We compared high frequency broadband activity (70-150 Hz) to find which brain areas were active for auditory, visual, or both tasks at the same time. Significant HFB activity was found in the left and right hemispheres in both tasks. Most left perisylvian regions were active in both tasks at the same time. In addition, very few brain areas were active only in one modality. Interestingly, even visual areas were found to be active in both modalities. However, there was a high degree of inter-individual variability between patients, meaning that very few patients showed overlap between both modalities in the same brain areas. In fact, the only brain region found to have visual and auditory overlap in more than one patient was the posterior cingulate gyrus in the left hemisphere. This may be explained by the fact this brain region has been associated with attentional control and the monitoring of sensory events, which are processes required in both tasks. Altogether, these findings suggest that common brain areas are involved in auditory and visual naming, which can be explained by overlapping processes in both tasks. However, there are also large inter-individual differences for word retrieval for visual and auditory stimuli that should be taken into account in modern neurobiological models of language production.

Session D-16

Poster Behavior and Social Sciences 17
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

479 2:15 pm RR

Clinical Comparisons of Men Diagnosed with Body Dysmorphic Disorder vs Muscle Dysmorphia

William Grunewald, Psychology (M)

Objective: Body dysmorphic disorder (BDD) is understudied and associated with severe morbidity and premature mortality. Muscle dysmorphia (MD) is a subtype of BDD which has received limited empirical examination, particularly with clinical samples and in comparison with other clinical populations. Thus, the aim of the current study is to explore psychosocial, sociodemographic, and psychiatric differences in a clinical sample of men diagnosed with BDD or MD. Method: Community members from the greater Boston, Massachusetts area were recruited to complete a one-time, in-person assessment, which included clinician-based structured interviews and self-report questionnaires. The total sample was N = 30 (MD group n = 15; BDD group n = 15). Results: Few statistically significant effects emerged. Of note, significant and large effects emerged with the MD group experiencing greater MD symptoms, BDD symptom severity, and adherence to traditional masculine norms. Medium-sized, non-significant effects, revealed that the MD group experienced greater eating pathology, appearance orientation, body dissatisfaction, and constituted a higher proportion of sexual minorities, compared to the BDD group. Discussion: Preliminary findings suggest that men diagnosed with MD may experience greater body image disturbance, eating pathology, and adherence to traditional masculine norms compared to men diagnosed with BDD. Future research comparing clinical samples of men with MD, BDD, and eating disorders are needed to guide the nosology, assessment, prevention, and treatment of MD.

480 2:15 pm SS

Stigma Surrounding Men with Bulimia Nervosa

Josh Lowe, Psychology (U)

Bulimia nervosa is an eating disorder that affects men and women of all ages, genders, and ethnicities. Men who have bulimia nervosa are often doubly stigmatized; first, for having an eating disorder (which is often depicted as only affecting women) and second, for seeking treatment or psychological help. In understanding the stigma surrounding eating disorders, the ultimate goal is to reduce said stigma so that this population can engage in and successfully complete treatment. The study used two different models in examining the stigma surrounding men with bulimia nervosa: the attribution theory and the Stereotype Content Model (SCM). The attribution theory sought to explain helping behaviors from controllability and emotions of liking, pity, and anger. The SCM and corresponding behaviors from intergroup affect and stereotypes (BIAS) map sought to explain active and passive facilitation and harm from stereotypes of warmth and competence and emotions of admiration, pity, envy, and contempt. The aim of the current study was to explore which model better explained helping behaviors towards men with bulimia nervosa in an effort to reduce stigma. Participants (n=503; mean age=24; 41% female, 32% male, 26% did not answer) were recruited through Qualtrics Panels and the Psychology Participant Pool. Participants read a brief vignette describing Jared – who was recently diagnosed with bulimia nervosa – and completed an online questionnaire using Qualtrics software. Regarding the attribution theory, participants who viewed Jared as less responsible for his bulimia nervosa pitied him more which resulted in more helping. Regarding the SCM/BIAS map, participants who

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viewed Jared as more warm pitied him more which resulted in more active facilitation. Also, participants who viewed Jared as more competent admired him more which resulted in more passive facilitation. Both frameworks proved useful in examining stigma helping behaviors towards a man with bulimia nervosa. Findings highlight the need for nuance in stigma research and stigma reduction efforts and could contribute to treatments and interventions for men with bulimia nervosa.

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481 2:15 pm TT

Symptom severity and associative stigma towards parents of children with disorders

Kiana Wiley, Psychology (U)

A growing number of studies have found associative stigma for mothers of a child with a behavioral or neurodevelopmental disorder regardless of physiological markers or the labeling of the disorder. Researchers have also found that, regardless of the disorder, the mother's gestation of the child as well as the rearing of the child was questioned resulting in mothers receiving blame and shame. The goal of the current study was to explore if parents of children with various disorders were differentially stigmatized when the child's symptoms were presented more (or less) severely. Undergraduate students (n=135) were recruited from the SONA participant pool to complete an online study for partial course credit. The majority of participants were female (86%) and freshmen (70%; average age=18.8) and the sample was ethnically-diverse (33% Caucasian, 27% Asian American, and 24% Latino American). The study employed a 2 (symptom severity: less, more) x 3 (condition: Attention Deficit Hyperactivity Disorder [ADHD], Autism Spectrum Disorder [ASD], and dyslexia) mixed-model design where severity was a between-participants factor and condition was a within-participant factor. Participants read vignettes describing children with various conditions and completed measures of associative stigma from the attribution model for the parents of the children (e.g., responsibility, blame, liking, pity, anger, personal assistance, likelihood of improvement, and likelihood that therapy would be beneficial). Results showed a significant symptom severity X condition interaction for personal assistance. Simple effects tests revealed that personal assistance was given most to the parents of a child with less severe symptoms of ASD relative to all other conditions. Significant severity main effects were found for responsibility and blame – with parents of children with less severe symptoms rated higher in responsibility and blame than parents of children with more severe symptoms. In testing the attribution model of associative stigma, the indirect effects of controllability (i.e., responsibility and blame) through liking on personal assistance were significant for ADHD, ASD, and dyslexia. These findings highlight the importance of removing/reducing blame from and/or increasing liking towards the parents in order to get parents the help and support they might need for their child and themselves.

482 2:15 pm UU

Nuances in the quantity, quality, and health-relevance of lesbians' social networks

Kelsey Bajet, Psychology (M)

Health disparities exist for sexual minorities (including lesbian and bisexual women and gay and bisexual men) in terms of psychological health, physical health, and health behaviors. In addition to these disparities, sexual minorities face unique stressors due to their minority group status which can impact health outcomes. It is well-documented that social relationships impact health outcomes (both psychological and physical) through social support. Relationship quality includes positivity and negativity and the two may co-occur within any relationship (ambivalence). Previous research has shown the detrimental effects of ambivalent relationships relative to wholly positive or supportive relationships. Knowing that health disparities among sexual minorities exist and that social relationships impact health, this study had two aims: 1) to explore the quantity and quality of lesbian women's social networks and 2) to examine the health relevance of those social networks. Self-identified lesbian women (n=244) were recruited from Qualtrics Panels to complete online surveys using Qualtrics software. They completed the Social Relationships Index – a measure of relationship quality – on up to 15 members of their social network: significant other, parents, family (up to 5), friends (up to 5), and coworkers (up to 2). They also completed measures of mental health (life satisfaction, depression, and loneliness) and health behaviors (exercise, sleep, etc.). In terms of Aim 1, participants reported on an average of eight social network members and the majority of those members were rated as ambivalent across all categories with the exception of friends (where the majority was rated as supportive). Furthermore, the majority (82%) of participants reported having a significant other. In terms of Aim 2, more supportive members were related to better mental health and health behaviors; while more ambivalent members were related to poorer mental health and health behaviors. These results demonstrate that quantity and quality of social networks have differential effects. Social networks and social support are nuanced in terms of who is in the network and what type of support they offer. These findings suggest that a better understanding of sexual minority social networks can help health professionals provide better care for sexual minorities.

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483 2:15 pm VV

Relationship Quality, Health Behaviors, and Mental Health of Lesbian Women in Romantic Relationships

Chandler Spahr, Psychology (M)

Social relationships (quantity and quality) influence mental health and health behaviors. Romantic relationships are especially important for adults as they can be the primary sources of co-occurring support and stress. Less research has been done on the effects of romantic relationship quality on the health and health behaviors of sexual minorities with

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some exception (like gay men and HIV risk behaviors, for example). Therefore, the purpose of the present study was to examine the association between romantic relationship quality and mental health and health behaviors in lesbian women. Participants were 244 ethnically-diverse cis-gender lesbian women (Mage = 46) recruited through Qualtrics Panels. They completed online surveys assessing relationship quality of their romantic partner (Social Relationships Index), mental health (Satisfaction with Life Scale, Loneliness Scale, and Beck Depression Inventory), and health behaviors (Multidimensional Health Behaviors Inventory). The majority (82%) of women reported being in a romantic relationship. After including covariates, multiple regression analyses indicated that relationship negativity significantly predicted lower life satisfaction, fewer hours of sleep, more loneliness, more stress(less rest), and more hours exercising. Relationship positivity significantly predicted fewer hours exercising. Relationship positivity X negativity interactions significantly predicted loneliness and health checks. Simple slopes analyses suggested that for high negativity, simultaneous low positivity was especially detrimental to mental health and health behaviors – higher loneliness and fewer health checks. Mediation analyses suggested that sleep may mediate the relationship negativity-mental health link such that the more a lesbian women views her romantic partner as negative, the less sleep she gets which in turn is related to lower satisfaction with life and higher loneliness. Although these data were cross-sectional, future research should examine these patterns over time to get at the temporal sequence of these variables. Similarly, exploring these within both members of the dyad would also elucidate the causal sequence. This information could inform clinicians who work with lesbian women and couples to help them reduce the detrimental effects of relationship negativity. Further, interventions aimed at improving the mental health and health behaviors of lesbian women could be developed in an effort to reduce documented health disparities.

484 2:15 pm WW

Latinx Transgender Mental Health: Needs of an Underserved Population

Jocelyne Sandoval, Psychology (U)

Research indicates that LGBTQ adults carry a higher burden of negative mental health outcomes compared to their heterosexual counterparts (McCann & Brown, 2018). Mental health disparities tend to be even more pronounced for Latinx transgender adults, due to compounded stressors of minority and LGBTQ status (Gowin, 2017; Rhodes et al., 2013). However, significant gaps exist in knowledge and understanding of the mental health needs of Latinx adults who identify as transgender. The purpose of this study was to explore the mental health profile of Latinx transgender individuals.

A total of 20 Latinx transgender-identified adults living in southeastern California, a subset of a larger sample of LGBTQ+ adults, participated in this study. All participants completed an online questionnaire developed in Qualtrics, which included measures of depression, post-traumatic stress disorder, alcohol and drug use, and degree of suicide ideation and suicide attempts in the last 12 months, perception of discrimination due to sexual minority status and ethnicity. In addition, participants were asked if, in the last 12 months, they experienced homelessness or exchanged sex for money, food, shelter, or other resources. Finally, participants were asked a set of demographic questions.

Data Analysis

Descriptive statistics, i.e., means, standard deviations, frequencies, correlations, indicated that participants showed elevated levels of mental health indicators and risk behaviors across all measured variables including depression, post-traumatic stress disorder, alcohol and drug use, suicide ideation and attempts in the last 12 months. Perception of discrimination due to sexual minority status and ethnicity were also elevated and both were significantly correlated to all mental health variables. In addition, 15 individuals (75%) indicated they experienced homelessness and 16 (80%) indicated they exchanged sex for money, food, shelter, or other resources in the past 12 months.

Discussion focuses on how results from this study can be utilized by mental health and social service agencies to improve services to for an important, but underserved sexual minority population.

Session D-17

Poster Interdisciplinary 12
Friday, March 1, 2019, 2:15 pm
Location: Montezuma Hall

485 2:15 pm XX

Exploring Oral Cancer Knowledge among Mexican-origin Adults

Isaiah Taylor, Kinesiology (U)

BACKGROUND: Head and neck cancer (HNC) accounts for 4% of cancers diagnosed annually in the U.S. or 50,000 and around 600,000 cases annually worldwide making it one of the most common on a global scale. However, while one of the more survivable cancers if detected early it is usually not detected until later stages due to delays in seeking care leading to later diagnosis and treatment, this is of particular urgency among Mexican-origin adults. Our goal is to conduct a systematic review of the literature to understand what social support and oral health behaviors are associated with oral cancer beliefs or perceptions to better understand upstream factors associated with cancer causal pathways. .

METHODS: Using PRISMA guidelines, we developed MeSH terms to identify and retrieve titles and abstracts relevant for the study. Then, a thorough assessment of each title and abstract using pre-established criteria will be conducted to reduce the overall pool of titles to those that we will review for full-text analysis.

: A preliminary search returned f 275 titles, we expect to

substantially limit this number and expect to find instrumental and informational social support to be most critical for this population. These types of support include those exchanged online, via an app, or among friends and family. We further hypothesize most of the literature will reveal a several lack of knowledge regarding oral cancer risk and outcomes..

DISCUSSION: We continue to lag in our understanding of the intersection of oral cancer and oral health in the context of patient experience, symptom referral, and treatment initiation to improve timely access. This gap is most persistent among minority and language diverse populations. Improving linguistically and culturally relevant measurement and characterization of these patient-centered knowledge pathways will facilitate identification of "critical points" adjacent to healthcare and treatment that could improve care alignment and contribute to timely quality care.

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486 2:15 pm YY

Low Adherence to and Poor Efficacy of Chemotherapy among African American/Black Women with Breast Cancer

Isaiah Jones, Psychology (U)

According to the American Cancer Society, African American/Black women have the second highest incidence of breast cancer and the highest mortality rate. Challenges related to successful treatment include low adherence and poor efficacy of chemotherapy, however, this literature review identified psychological distress as another contributing factor to those challenges. A narrative literature review was performed using PubMed and other peer-reviewed databases associated with California State University's OneSearch collection, and review of information from the American Cancer Society and the National Institute of Health's Surveillance, Epidemiology, and End Results Program. Search terms included: breast cancer, African American/Black, women, chemotherapy, racial/ethnic, disparity, and distress. Factors that contribute to low adherence include chemotherapy-related alopecia, distance from treatment centers, lack of health insurance, lower socioeconomic status, and increased depressive symptom incidence. Factors that contribute to poor efficacy of chemotherapy include low screening compliance, delays in diagnosis and/or treatment dosing, insufficient receptor categorization, and stress hormone interaction with tumors. Psychological distress may play a role due to African American/Black women's coping and support systems. Depression stemming from these multiple existing factors, in addition to the burden of breast cancer and intensive treatment, influences patient behavior and commitment to timely treatment. While patient mental health and SES negatively affect adherence to chemotherapy in African American/Black women, patient noncompliance and insufficient treatment affect suboptimal chemotherapy efficacy. Oncologists should be aware of the unique factors explaining low adherence and poor efficacy, as well as the impact of patient psychological distress.

487 2:15 pm ZZ

Patient Barriers to Obtaining Breast Cancer Survivorship Care in Primary Care Settings

Dalia Shantel Valencia, Psychology (U)

Background/Purpose The survival rates from breast cancer have increased over the last two decades, leading to a growing number of breast cancer survivors needing survivorship care. The purpose of this literature review was to identify the survivors' barriers to receiving optimal breast cancer survivorship care.

Methods

This review searched the PubMed, PsycINFO, and CINAHL databases using such keywords as primary care, barriers, and breast cancer survivorship. A secondary review of reference lists from key articles was also conducted.

Results

Breast cancer survivors faced numerous obstacles in obtaining recommended breast cancer survivorship care, including: (1) transportation challenges to reach health care providers and services, (2) insufficient health insurance, (3) insufficient health literacy, (4) limited English proficiency, (5) fear of cancer recurrence, and (6) depression.

Discussion

This literature review suggests many barriers prevent breast cancer survivors from receiving optimal care after completion of cancer treatment. Efforts to reduce barriers should focus on increasing access, assisting with problem solving for logistic barriers, improving cancer communication, and addressing anxiety and depression.

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488 2:15 pm AAA

Primary Care Providers' Barriers to Providing Breast Cancer Survivorship Care

Rosa Buenrostro, Psychology (U)

Background/Purpose

Breast cancer is the most prevalent cancer amongst women. Fortunately, survival rates are rising, and more patients transition to survivorship care. However, this care is typically provided by primary care providers (PCP). This review identifies the challenges to providing optimal breast cancer survivorship care experienced by PCP.

Methods

This review searched the PubMed, PsycINFO, and CINAHL databases using keywords: breast cancer, survivorship, primary care, and barriers. A secondary review of reference lists from key articles was also conducted.

Results

Numerous challenges were identified that negatively impact the quality of breast cancer survivorship care delivered by PCP. PCP expressed insufficient understanding of survivorship care guidelines. Furthermore, they were unclear about their specific roles and responsibilities in providing this type of care. Most PCP carry a small load of cancer cases, making it difficult for

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

them to be confident in the survivorship care being provided. PCP also reported having limited resources to meet these guidelines, such as the capacity to provide mental health referrals for patients.

Discussion

PCP lack expertise, training, and resources to properly care for the growing number of breast cancer survivors. Additional training for PCP may not be enough to address these shortfalls. Instead, collaboration between PCP and oncologists may offer the best strategy to ensure breast cancer patients receive the survivorship care needed.

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489 2:15 pm BBB

The Co-existence of Causal Beliefs about Cancer at the US-Mexico Border

John Moreno, Psychology (U)

Cognitive psychologists long believed that scientific knowledge eventually replaces intuitive or folk beliefs (e.g., Piaget, 1954). Increasing evidence, however, illustrates the contrary (Legare et al., 2012). The co-existence of seemingly incompatible beliefs is particularly common when individuals face a life-threatening illness such as cancer that resists simple explanations or cures. These issues are complexified in bicultural regions such as US-Mexico border where structural and cultural factors may interact in unique ways to shape healthcare beliefs and practices. Most studies examining cancer beliefs in this region have used interviews or surveys that do not explicitly probe for the coexistence of different causal beliefs or control for participants' levels of acculturation (e.g. Collins et al., 2008). This study, therefore, uses an experimental approach systematically probing for the co-existence of causal beliefs about cancer among 30 students at SDSU's Imperial Valley Campus located near the US-Mexico border. Following Legare and Gelman (2008), we created a set of vignettes in which a protagonist is diagnosed with cancer. For each vignette, contextual information was varied to create four priming conditions: a neutral condition with neutral information, a biomedical condition that highlighted biological information, a sociorelational condition that highlighted the sociorelational information associated with Mexican folk models of illness, and a combined condition that highlighted both. Participants received a total of 8 vignettes, two for each condition, presented in random order. After each vignette, participants were asked to endorse different possible causes of the protagonist's cancer using a 5-point Likert-type scale and were asked to justify each rating. Crucially, they could endorse multiple causes, allowing us to probe for the coexistence of different beliefs and the conditions under which they are elicited. Participants' acculturation to US and Mexican cultures was also assessed using the ARSMA-II. Results showed that participants endorsed biological causes in all conditions, however, they endorsed sociorelational beliefs only when this information was made salient. Acculturation levels were strongly associated with the endorsement of sociorelational but not biological beliefs. We discuss the interpretation and implications of these findings for healthcare practitioners working with this and similar populations.

490 2:15 pm CCC

Advance Care Planning among Rural Cancer Patients and Its Associated Factors

Nayeli Gonzalez, Social Work (M)

Background:

Advance care planning (ACP) is the process of helping individuals with end-of-life (EOL) decision making by engaging in EOL communication with family and physicians and documenting their EOL treatment wishes in an advance directive (AD). ACP is imperative for patients with a chronic diagnosis, such as cancer, but little is known about ACP among rural cancer patients.

Aim:

The study aimed to explore to what extent rural cancer patients engage in ACP and its associated factors.

Design and Sampling Method:

This used a cross sectional design. Cancer patients who received services Cancer Resource Center of the Desert (CRCD) in Southern California along the US-Mexico border were recruited using a convenience sampling method. Inclusion criteria were cancer patients; age 18 and older; cognitively competent; residents in Imperial County, CA.

Data Collection:

The data was collected from January 2018-January 2019 by a trained research assistant using a structured questionnaire at the private office of CRCD. Each Interview lasted approximately 30-40 min. Study procedure was approved by the San Diego State University.

Data Analysis:

Descriptive statistics were used to describe the participant's socio demographic variables. Bivariate test (chi-square) were conducted to compare the means and distribution of study variables by the status of engaging in ACP.

Results:

The majority were (74.4%, n=67) were female and Latinos (n=93.3%, n=84). Average age of the patients is 58.5 years old. About 46% reported engaging in ACP. In detail, 11% (n=10) completed an AD and 40% (n=36) and 12.2% (n=11) engaged in EOL discussion with family and doctors, respectively. Patients engaging in ACP were more likely to hear about an AD, $x2$ (2, N= 90) =7.663, $p < .05$), comfortable in discussing about EOL care with family, $x2$ (2, N= 90) =10.16, $p < .05$) and believe that pain and suffering is part of God's plan, $x2$ (4, N= 90) =11.14, $p < .05$).

Conclusion:

It is important for health care professionals to assess patients' knowledge about AD and also their attitudes toward discussing EOL care and how religion/spirituality relate to making EOL decisions.

SRS

Abstracts of Presentations

Session E, F, G, H and I

SAN DIEGO STATE UNIVERSITY

Session E-1

Poster Physical and Mathematical Sciences 11
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

491 4:00 pm A

Geochemical Identification of Sediment Production Hotspots in a Semi-Arid Urbanizing Watershed

Garrett McGurk, MS Watershed Science (M)

Erosion has been identified as a primary factor in land degradation across varying habitats worldwide, and may be a problem in generating cross-border sediment loads. Anthropogenic activities including construction practices, altered proportions of impervious surfaces, and changes in channel characteristics are responsible for altering the hydrology of a disturbed watershed. This research conducted a case-study of the highly urbanized Los Laureles Canyon Watershed (LLCW) in Tijuana, Mexico, which crosses the US-Mexico border and discharges high sediment loads into the Tijuana Estuary in San Diego County. We evaluate the applicability of numerical soil loss modeling in urbanized watersheds through the use of geochemical analysis of sediment samples. Sediment samples collected throughout LLCW were analyzed using X-ray fluorescence (XRF) analysis to determine the geochemical composition of the samples. Multivariate statistical analyses were paired with sediment fingerprinting techniques to determine what sediment groups in LLCW were the primary contributors to the overall sediment budget. Sediment loading rates from this analysis were compared with estimates generated by the Annualized Agricultural Non-Point Source (AnnAGNPS) model for LLCW to evaluate how well the model was able to predict sediment generation in the watershed. This research contributes knowledge about the degree to which modeling and geochemical analysis can be combined in complex urban border regions to predict sediment sources, with implications for management strategies to reduce cross-border sediment loads.

492 4:00 pm B

Enantiomer Migration Order Reversal of Tetrahydrozoline in Capillary Electrophoresis

Tamar Basiashvili, Chemistry emphasis in Biochemistry (U)

In the given study enantiomer migration order of tetrahydrozoline in presence of beta cyclodextrin and its derivatives was investigated. Inclusion cavities of B-Cyclodextrins formed by seven alpha (1à4)-linked glucose units act as a chiral selector for small molecules. Minor changes in chiral selector beta cyclodextrins can give rise to enantiomer migration order changes based on the size of the cavity and intermolecular interactions between selector and selectant. Analysis on native beta cyclodextrin and its derivative heptakis (2-O-methyl – 3,6-di-O-sulfo) beta cyclodextrin gave rise to enantiomer migration order reversal. Given study is aimed at understanding the underlying principles of the enantiomer migration order changes in capillary electrophoresis.

493 4:00 pm C

The use of capillary electrophoresis techniques in detecting the glycosylation of hemoglobin to determine blood doping

Madison Noroña, Chemistry (U)

Endurance athletes have been known to partake in blood doping, among other doping methods to cheat their competitors. Blood doping enhances their athletic performance, as the result allows the athletes to transport more oxygen throughout their body. Although homologous blood doping, blood transfusions from another human, is detectable, autologous blood doping, blood transfusions from the same individual, has proven difficult to detect due to the transfused blood cells consisting of nearly identical properties to the fresh blood cells.

The standard autologous transfusion process involves the collection of a pint of blood from the individual. This blood is stored in an anticoagulant solution, such as CPDA-1, which also contains a high concentration of glucose. This glucose has an impact on the stored blood; the glucose can glycosylate proteins in the blood, including hemoglobin found within the red blood cells. This modification of the proteins may prove to be a means through which autologous blood doping could be identified.

Capillary electrophoresis is a separation technique which is useful in differentiating compounds based on each compound's electrophoretic mobility, where compounds pass through the detector at different times based on their charge to size ratio. CE techniques should be effective in detecting the size and charge differences between the native and glycosylated hemoglobin from the blood cells. This analysis will require the lysing of the red blood cells, and the detection of a relatively small amount of glycosylated hemoglobin (<5%) within a large concentration of hemoglobin.

This poster will present the beginnings of investigating how the glycosylation of hemoglobin within red blood cells can be detected with CE separation techniques.

494 4:00 pm D

Electrochemically-Controlled Dimerization in Ferrocene Ureidopyrimidone Derivatives. the Effect of Ferrocene Position

Veronika Mikhaylova, Chemistry with emphasis in biochemistry (U)

Ureidopyrimidones (UPy's) are well-known to dimerize in weakly polar solvents such as CH2Cl2, via the formation of four strong, linear H-bonds. This, coupled with their relative ease

of synthesis, has led to their use as a linker in supramolecular polymers and gels. The attraction of such materials is their inherent self-healing properties, whereby a defect can be repaired by using heat or mechanical stress to reversibly break the polymer at the H-bond sites. This increases the fluidity of the material, allowing the defect to fill in. Upon cooling or relief of stress, the H-bonds reform and the defect is repaired. However, while the use of heat or mechanical stress as stimuli are clearly useful, neither is inherently very selective. On-going research in our lab is focused on increasing the versatility of the UPy system by creating electroactive UPy's in which dimerization strength can be controlled in a more selective manner through oxidation and reduction.

Previously, our group has shown that dimers based on the ferrocene-UPy derivative, 1, break apart upon oxidation of the ferrocene to the ferrocenium form at mM concentrations in CH2Cl2. This could be due both to the creation of electrostatic repulsion and a decrease in H-bond strength due to the reduced H-donor ability of the O and N on the pyrimidone side. In this project, another Fc-UPy has been prepared, 2, in which the ferrocene is attached to the urea side of the molecule. In contrast to 1, oxidation of 2 shows a single reversible ferrocene CV wave in CH2Cl2 at mM concentrations. Under these conditions, 1H NMR indicates that 2 is fully dimerized, thus, it appears that, unlike with 1, oxidation has no significant effect on dimerization of 2. In both cases, oxidation would increase electrostatic repulsion. However, unlike in 1, oxidation of 2 should actually increase H-bond strength by making the urea NH a stronger H-donor. Therefore, it appears that the effect of oxidation on the H-donating or accepting ability is a more crucial factor for dimerization control than electrostatics in these systems.

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495 4:00 pm E

Study of Toxicity of Cadmium and Zinc Ions Using Vegetative Test Systems (on the example of Lemna minor L.)

Asmat Kontselidze, Chemistry/Biochemistry (U)

Nowadays, technological development is the main reason for anthropogenic pressure on the world. The number of chemicals which are considered as dangerous toxic compounds, are day-by-day increasing. Heavy metals group is also considered as a part of those toxic chemicals. However, plenty of scientific researches are carried out on this phenomenon, the toxic effect on the various biological objects is still acute scientific problem. The mechanism of heavy metals' impact on biosystems is quite diverse. Because of this purpose, one of the approaches of the research is using biotests. In our research we used two heavy metals' ions, Cd++ and Zn++, and investigated their impact with using Lemna Minor L. biotest. Cultivation of Lemna was implemented with Steinberg nutrition in the Petri dishes. Testing reaction was the growth of leaflets as well as the number of plants. The concentrations of heavy metals were following: 0.001 mg/ml;0.005 mg/ml ; 0.01 mg/ml ; 0.05 mg/ml for Cd++ and 0.01 mg/ml ; 0.05 mg/ml; 0.1 mg/ml; 0.5 mg/ml for Zn++. The intensity of cultivation of Lemna colonies was determined by 3 days interval for 2 weeks. On the basis of the experiment we conducted Cd and Zn toxicity level, in particular (at 0.05 mg/ml Cd and 0.5 mg/ml Zn) Cd toxicity in respect of control variant was 35% , while Zn toxicity was 73%. Indeed, Cd toxicity exceeds Zn toxicity by 38%. If we take into consideration the fact that the values of these two elements are different on the metabolism of live cells, we can assume activation of different mechanisms. In this sense, the ions we examined are also differentiated by the fact that if any form of cadmium ions can be considered as a damaging factor, zinc performs the function of the micro element in small concentrations, which is essential for normal functioning of inner metabolism. Therefore, the difference of toxicity that is mentioned in the results of our research, is suggesting more complex mechanisms than the individual toxicity level of elements.

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496 4:00 pm F

The Effects of Legislation and Water Management in the Imperial Irrigation District

Nadine Barham, Environmental Science (U)

Due to industrial agriculture in the Imperial Valley, runoff has formed and collected in the Salton Sea—a shallow, saline, and nutrient-enriched body of water. Due to the diversions of the Colorado River and extreme droughts, inflows to the Salton Sea are or are likely to decrease. The exposed lakebed of the Salton Sea allows toxic particulates to be transported through the air—causing air pollution and ecological shifts. The Quantification Settlement Agreement (QSA) was enacted to mitigate the Salton Sea enacted by the Imperial Irrigation District (IID). The QSA has dedicated a short mitigation period, from 2003 to 2017, to the Salton Sea. The IID plays a significant role in involving farmers in QSA stages.

4 Stages of QSA: Fallowing Program (FP): Incentivizes farmers to volunteer partial/ full fields. Runs in tandem with Salton Sea Mitigation. Salton Sea Mitigation: Portions of "conserved" water from the FP will be transported to the Salton Sea (from 2003 to 2017) and the San Diego County Water Authority. IID/ MWD System Efficiency: Conservation measures provided by the Imperial Irrigation District and Metropolitan Water District. On-Farm Efficiency (OFECP): Farmers can petition for irrigation upgrades or land modifications. The IID has full disclosure to reject/approve potential projects.

The focus of the study is trying to determine the effectiveness of the QSA by questioning areas of each stage. Methods require the gathering of legislative documents, extracting data from ESRI databases, and analyzing data in CRAN-R Studio and ArcGIS Desktop. Using published data and ArcGIS, there was slight clustering during the fallowing program. This preliminary data will be confirmed through CRAN-R Studio and METRIC-EEFLUX (Landsat imagery). By analyzing the IID data, the water conserved ranged from 5.0 ft to 6.7ft; which is a realistic amount of water to conserve. By analyzing published documents, found that the IID System Efficiency relies on the reduction of return flow. In the OFECP, there is clustering of rejected projects to the Southwest portions and clustering of

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paid projects in the central region. The QSA is a preliminary step towards addressing sensitive areas.

Session E-2

Poster Physical and Mathematical Sciences 12
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

497 4:00 pm G

Proton Neutron Interacting Shell Model: Order of Magnitude Reduction of Basis Dimension for Medium Mass Nuclei

Oliver Gorton, Computational Science (D)

Detailed information about the structure and properties of atomic nuclei (the center of atoms) are critical for a number of scientific and even national security interests. Much of what is needed can be measured in a laboratory, but for a significant number of calculations, nuclear scientists have to rely on theoretical predictions from quantum mechanics. The problem theorists have is that the quantum N-body problem -which you have to solve for each nucleus - is a non-trivial computational task, with millions or billions of basis dimensions.

In one approach to solving the Schrodinger equation for the nucleus, we represent the system as a matrix eigenvalue problem in what is called the shell model (SM) approach. In this work I present preliminary work by myself and my advisor Dr. Johnson, to truncate the basis space in which we frame the computational problem. By selecting the most important basis states, and leaving out the least important basis states, it is possible to reduce the computational and memory requirements of this problem by an order of magnitude. The method for selecting basis states is to construct the mixed-proton-neutron basis out of eigenstates of the pure-proton and pure-neutron solutions of the Hamiltonian. We present results for some medium mass nuclei which were carried out on a laptop where otherwise a supercomputer would have been necessary.

498 4:00 pm I

Asymptotic Elasticity of Affine Semigroup Elements

Jackson Autry, Master of Arts in Mathematics (M)

For affine semigroups in dimension 2 and 3 we study the problem of determining the asymptotic behavior of the elasticity of monoid elements along a given ray.

499 4:00 pm J

The Discovery of a Transiting Circumbinary Planet in KOI-3152

Quentin Socia, Astronomy (M)

One of the most exciting discoveries to come out of the Kepler mission was the detection of planets that orbit binary stars, known as circumbinary planets (CBP). Here we report the discovery of one more CBP, KOI-3152 b, adding to the 11 CBPs currently known. KOI-3152 is a mildly eccentric eclipsing binary (e=0.1) with a 28.2-day period and containing stars with ~0.81 and ~0.26 solar masses. Only three transits were observed in the Kepler light curve (across the primary star), despite the planet's orbital period being ~170-days. More transits were not observed due to unfortunate data gaps and the rapid precession of the CBP's orbit. The rate of precession and the radius of the planet (between Neptune and Saturn size) are consistent with the family of previously detected Kepler CBPs. The discovery of KOI-3152 b adds one more crucial member to the growing CBP population.

500 4:00 pm K

Discovery of an Unusual Eclipsing Binary Star from Kepler Data

Tiffany Shumack, Astronomy (U)

Within the star cluster NGC 6819, unusual behavior has been observed in an eclipsing binary star system --- superficially, the orbiting stars appear to go in and out of contact over the course of a few days. NASA's space telescope Kepler observed hundreds of thousands of celestial objects within its field for more than four years, and we have used Kepler data to study the eclipsing binary system A355. We analyzed the brightness variations of the binary (which orbits every 8.37 hours), and identify a regular and predictable variation in how deep the eclipses get over the course of 1.892 days. We discuss potential explanations such as large starspots, gravitational effects of a third object (like a star or star corpse), and rapid changes in the stellar surfaces. The hypothesis of a third star is promising, as measurements of the combined light from the system indicates that it probably contains more than two normal main sequence stars.

501 4:00 pm L

The Apsidal Motion Constants in the Triple Star System KOI-126

Mitchell Yenawine, Astronomy (M)

KOI-126 is a triple-star system exhibiting complex, fascinating eclipses. It contains a pair of M-stars (KOI-126 B and C) that orbit each other once every 1.7 days, while simultaneously orbiting an F-type star (KOI-126 A) every 33.9 days. These orbits are aligned in such a way that from Earth's perspective the M-stars pass in front of the F-star. The resulting eclipses enable very precise mass and radii determinations through

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photodynamical modeling: MA=1.347, MB=0.2413, and MC=0.2127 M☉; RA=2.0254, RB=0.2543, and RC=0.2318 R☉, with uncertainties of just a few percent (Carter et al. 2011). Due to tidal interactions between the three stars, the M-star binary's orbit is slightly eccentric and is quickly precessing. This offers us a rare opportunity to measure the rate of precession, which yields the "apsidal motion constants" (k2,1 and k2,2) of the M stars; these have never been measured for low-mass stars. The apsidal motion constants in turn provide information on the internal mass distribution inside the star. This is important for M stars, since it could provide insight on the decades-old problem of the discrepancy between theory and observations of M-star radii. To improve upon the Carter et al. estimates and more tightly constrain the k2 values, we model all 17 Quarters of Kepler data and include 5 additional (post-Kepler) eclipse events observed with the Mt Laguna Observatory (MLO) 1-meter telescope. We also utilize a novel variation of the Nelder-Mead simplex "amoeba" minimization technique. The standard amoeba optimizer is well known to have difficulty in parameter spaces with high dimensionality and/or local minima (the KOI-126 model has 29 free parameters). Our new approach uses an additional stochastic vertex in an attempt to overcome the limitations of a simple amoeba. This fast minimization provides an important check on the results obtained from Markov Chain Monte Carlo (MCMC) methods.

Session E-3

Poster Engineering and Computer Sciences 8
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

502 4:00 pm M

Soft Real-Time Process Re-Prioritizer

Riker Quintana, Computer Engineering (U)

With increasing hardware capabilities and computation needs, today's embedded systems have become extremely multi-tasked. Although this leads to higher system throughput, the performance of individual tasks might fluctuate beyond desired levels. We aim to find a program's optimal performance by analyzing a series of user-space tasks running at different priority levels in a Linux operating system. In our research, we have chosen to gauge optimal performance by a task's total execution time and the number of context switches. The priority levels are determined by the user-space task's "nice" value within the Linux kernel. With these defined performance values our systematic approach becomes clear: calculate the optimal nice by analyzing the lowest number of context switches and task completion time. In addition, the OS would apply the optimal nice value to the process in real-time while the process is actively running.

Through our experiments, we were able to draw multiple conclusions. We observed that testing under a near-full processor load let to more consistent and accurate results. An idle load would cause nondeterministic results to occur because the number of background system tasks running in parallel was uncontrollable. This lead to spikes in processor utilization. We also concluded from our data collection that there is no universal nice value that is best for all processes. In addition, by looking at trend lines we concluded the higher nice value will decrease task completion time, but context switches can increase/decrease depending on the type of process. When attempting to reprioritize a process with its optimal nice value, we found if our script ran too often it would cause severe overhead in the system. From these conclusions, we are able to systematically identify processes that can run more optimally and set those processes to always run in an optimal state from that point onward.

503 4:00 pm N

Intravenous Therapy Roller Clamp

Frances Lagarda, Bioengineering Biomaterials (M)

Intravenous therapy or IV is used in clinical settings to administer fluids or solutions to patients. The IV administration set is composed of the primary infusion tubing, drip chamber, backcheck valve, IV bag, and roller clamp. The roller clamp is used to regulate fluid flow rates by deforming the tubing. It consists of a body with a recess in which a roller moves as to clamp the tubing against the body wall. A clinician will typically count the drops in the drip chamber of the gravity infusion set and move the roller down the groove of the device to slow the infusion to the desired rate. Although roller clamps are widely used, the ease of use of the roller clamp design is poor, resulting in potentially large errors in dosage. The aim of this study was to identify critical parameters in the design of the device and to develop a transfer function that relates these parameters to the operation of a roller clamp.

A testbed was built for measuring pressure and flow through the roller clamp tubing while it is being used to control the drip rate. The IV set was simplified to isolate the roller clamp and preliminary data was obtained from this. The results indicate that the typical use of a roller clamp causes an abrupt change in fluid flow, with an expression alike a step function.

504 4:00 pm O

A Computational Model for 3D Collective Cell Migration Guided by Stochastically Generated ECM

Tyler Collins, Bioengineering (M)

Collective cell migration is vital for tissue growth and maintenance in processes such as morphogenesis and wound healing, as well as, other mechanisms in the body such as metastasis. Migration as a collective occurs when sheets, streams or clusters of cells are led through the extracellular matrix (ECM) by "leader" cells, and use intercellular communication, such as mechano-transduction and chemotactic signaling. Certain ECM properties that have been shown to play a significant role in cell migration are fiber stiffness, fiber density, fiber alignment, fiber diameter, ECM topology, bond density, and chemical signaling.

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While experimental results have provided insight on which ECM properties affect migration, the mechanics of collective cell migration in 3D are still not well understood and various models are being explored to better understand migration. In our model we chose to stochastically and temporarily generate ECM fibers as guides for movement, and pass intercellular forces through neighboring cells in contact. We chose parameters that have proven to be experimentally significant, such as fiber density, fiber alignment, pseudopod search time and adhesive force strength. Cluster parameters tested were cluster size, cluster shape, and leader scenarios, with the simulations running until cluster dissociation. In addition, we simulated 40 cells with random placement to evaluate cluster sizes. The aim of this research was to simulate clusters of cells migrating long-term in 3D with both cell-cell and cell-matrix interactions.

We found cluster velocity, cluster time, and cluster mean-square-displacement (MSD) vary as the ECM conditions are modulated, reinforcing the idea that not only single cell migration is affected by ECM conditions, but collective cell migration is as well. In addition, changes in cluster conditions were found to affect cluster migration. We believe our physics based computational model further develops the concepts of cell migration, and with it we were able to determine which simulated scenarios could significantly affect migration in experimental research.

505 4:00 pm P

Analyzing Embedded System Security

Kevin Belew, Computer Engineering (U)

With an increasing adoption of Internet of Things (IoT) in smart home applications, automotive industries, wearables and the medical fields, more non-technical users are utilizing the Raspberry Pi to deliver services, due to its ease of use and low cost. The Raspberry Pi utilizes the Raspbian operating system (OS), which is a derivative of the Linux OS. The open source development community has developed many security features on Linux to prevent malicious behavior on its system. The goal of this project was to analyze the Raspbian operating system to find vulnerabilities in its security. Our results indicate that the operating system is vulnerable to foreign attacks. When developing on the system, the user is periodically asked for the password to access high security programs. Using indirection, we were able to exploit the user to open a modified program. The program logged the user's keystrokes, transferring the user's data to an external resource. Next, it halted the system by using all the system resources, causing the user to panic and press a commonly used key which deleted the entire system, including traces the system was ever penetrated.

506 4:00 pm Q

Smartphone Based Gesture Recognition

Shota Amashukeli, Computer Engineering (U)

The project explores the plausibility of running high-accuracy single-camera gesture recognition system using a modern smartphone device and its usability as an IoT controller. Convolutional and Recurrent Neural Networks have been used in the detection process. The project is in progress and currently in the dataset-gathering phase.

Session E-4

Poster Engineering and Computer Sciences 9
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

507 4:00 pm R

Utilization of a Non-targeted Approach to Develop a Comprehensive Array of Persistent Pollutants in Reclaimed Wastewater

Lauren Steinberg, Environmental Engineering (M)

Rising population growth has led to an increase in water demands for both rural and urban sectors and creates pressure on aging sewerage distribution infrastructure. Decentralized wastewater treatment systems (DEWATS) have gained increasing acceptance for their potential to reduce burdens on existing systems and create alternatives for non-potable water reuse and agricultural biosolids applications. Low-energy DEWATS offer low-cost opportunities to alleviate problems associated with water scarcity and poor sanitation in developing countries. The detection of chemicals of emerging concern (CECs), compounds produced from pharmaceuticals and personal care products which enter inlet wastewater streams, has been of increasing interest for both centralized and decentralized wastewater treatment systems. Compounds that are not completely removed during treatment processes are released into natural water systems at low concentrations, creating potential threats to environmental and human health. Many partially degrade or transform into new compounds, which can be more toxic than the original parent compound. The presence, removal and transformation of CECs in water systems is not well understood, and further research is required to determine their fate and understand capabilities of aerobic and anaerobic treatment pathways. This research employs gas chromatography coupled to time-of-flight mass spectrometry (GCxGC-TOF/MS), an advanced, highly sensitive non-targeted analysis technique, to detect known and unknown compounds persistent in aerobic and anaerobic treated wastewater. Influent, effluent and sludge samples of primarily domestic wastewater were collected from three treatment systems: 1) an anaerobic baffled reactor DEWATS facility in South Africa, 2) a small activated sludge wastewater treatment plant in South Africa, and 3) a small activated sludge wastewater treatment plant in California, USA. Samples were prepared for analysis via solid phase extraction, analyzed for polarity and mass spectral information using GCxGC-TOF/MS, and identified using a Statistical Compare processing software. Results identified known and previously unknown parent compounds, as well as metabolites formed during treatment processes. Comparison of influent, sludge and effluent results

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identified persistent compounds as well as compounds retained in the sludge. The findings of this research improve our understanding of the effectiveness of aerobic and anaerobic treatment systems and have important implications for surface water quality and agricultural water reuse.

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508 4:00 pm S

Mapping Potential Contamination Sources in the San Diego River Watershed

Alyssa Jaramillo, Civil Engineering (U)

This research will provide a method to estimate potential contamination sites along the San Diego River. To quantify the impact that humans may have on the San Diego River, geospatial data was used to highlight areas in the riparian zone (land adjacent to the river) that may potentially contribute contaminants to the river. Field data and observations from the riparian areas were combined with relevant watershed characteristics such as land use, soils, watershed boundaries, sewer infrastructure, and flood potential. Field data consisted of an annual geospatial dataset collected using a georeferencing application in October of 2017 and 2018 by the San Diego River Park Foundation during their annual RiverBlitz. These data were used to inform the location of trash for river cleanup events. Data included the location and identification of type and abundance of trash found along segments of the river. Amongst this information, trash locations also comprised sites containing large or unique items such as bikes, shopping carts, golf carts, scooters, and latrine sites. Repeated data collection also provides the opportunity to analyze the San Diego River over time. Estimates of flood events will be used to estimate the area of land and trash inundated by the river during storm events. Further analysis will approximate the runoff potential for sites that may be sources of contamination during high streamflow events. Combining long-term geospatial based hydrology with contamination data will also improve our predictive capabilities of water quality along the San Diego River.

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509 4:00 pm T

Soil moisture and hydraulic conductivity patterns in Alvarado Creek, San Diego

Quinn Walker, Environmental Engineering (M)

In densely populated areas, urban creeks can pose flooding and sedimentation risks to communities. Properties such as hydraulic conductivity and soil moisture can also strongly influence the runoff potential in semi-arid regions. This research characterizes the spatial and temporal patterns of soil moisture and hydraulic conductivity in Alvarado Creek in San Diego, California, which is a coastal and perennial tributary of the San Diego River and consists of non-native and native vegetation. Dry season soil moisture and infiltration processes are observed repeatedly at two transects, the Pedestrian Bridge (PB) and Culvert (CUL), from May 26, 2018 to August 11, 2018. In-situ soil moisture measurements were performed every 0.6 meters along each transect using a soil moisture probe to estimate volumetric water content (%). Hydraulic conductivity was estimated at two to three locations along PB and CUL using a Mini Disk Infiltrometer to infiltrate a known volume of water into the soil. Corresponding canopy cover (area of ground covered by trees), relative humidity (amount of water vapor present in air), and air temperature were incorporated into this analysis. Soil moisture values increased with proximity to the stream and ranged from 0 to 10 % in the upland areas, 0 to 20 % in transition zones, and 0 to 51.5% in the stream margins. There was no correlation ($R2 < 0.16$) between soil moisture and infiltration to air temperature, canopy cover, and relative humidity. Soil moisture and relative humidity for the upland left bank of CUL was statistically significant ($p<0.05$). Soil moisture and temperature for both the riparian zone of PB and the upland left bank of CUL were also statistically significance ($p<0.05$). Preliminary results suggested air temperature most significantly influenced the dry season soil moisture and hydraulic conductivity properties. Experimental in-situ values, such as those collected in this work, are crucial to understanding perennial urban streamflow processes, which can ultimately improve the accuracy of rainfall-runoff simulations and flood inundation predictions in semi-arid climates.

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510 4:00 pm U

T7 Coliphage Decay Rates After Repeated Exposures to Sodium Hypochlorite

Fei Zhao, Environmental Engineering (M)

Free chlorine originating from the use of sodium hypochlorite, which is used in water disinfection processes, inactivates pathogens by causing irreversible damage to proteins and nucleic acids. Recent studies have shown that viruses can evolve to develop increased resistance to chlorine dioxide, and it has been hypothesized that the reason for this is that the viruses develop mutations in their genome that confer a competitive advantage in vitro. There have not been similar studies done with viruses exposed to free chlorine. Therefore, we repeatedly subjected a laboratory strain of T7 coliphage to a chlorine dose that caused an inactivation of 90% – 99.9%, and then regrew the surviving phage to understand if this selective pressure induced an increased resistance. This process was completed ten times to produce ten sequential generations of exposed T7 phage. The doses of free chlorine administered ranged between 75 – 126 mg-sec/L, and the observed log reductions ranged from 1 – 3 log units. The first order decay rate coefficients ranged from 0.03 – 0.003 L/mg-sec, and the overall decay rate coefficient for all generations was 0.01 L/mg-sec. However, after seven generations, the exposed T7 coliphage group did not appear to have any increased resistance compared to the original stock, which is in contrast to findings from the previous study done with MS2 coliphage and chlorine dioxide. Chlorine dioxide has previously been reported to mainly affect virus attachment (with less evidence of genome damage) while free chlorine has been reported to affect both the virus capsid and the genome. MS2 coliphage is also structurally different from T7. These could be possible explanations for the results observed.

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511 4:00 pm V

Predicting Pathogen Flows through Sanitation Systems: Knowledge to Practice Using the Global Water Pathogens Project

Isaac Musaazi, Environmental Engineering (M)

In order to achieve safely-managed sanitation, it is crucial for practitioners to make decisions based on an understanding of the occurrence, fate, and transport of excreted pathogens along the sanitation service chain to limit possible exposure to populations. This also necessitates sanitation planners being able to access scientific data on pathogens to support decision-making, policy development and advocacy. We have developed a tool that predicts pathogen flows through sanitation systems accessible via a web app that leverages resources generated by the Global Water Pathogens Project (www.waterpathogens.org). The tool estimates the log reduction of pathogens along the service chain and allows users to assess the percent probability of achieving a desired overall log reduction value. Pathogen flows are mapped throughout the sanitation service chain, which includes both onsite and centralized treatment technologies and components. The user has the option of importing data about the different components and features of their own spreadsheets into the app, or collecting new data using a mobile device to conduct household surveys. All data uploaded is validated to check for its integrity and ensure that the data complies with the requirements and quality benchmarks essential to predict the survival and transport of pathogens throughout the system and into the environment. Additionally, the centralized treatment system component of the app will enable users to sketch out the configuration of their treatment system as a directed acyclic graph (DAG) with a defined source and a sink (discharge) of pathogens, and this information is stored as a JSON file. In this presentation, we will demonstrate the use of tool for a case study of a sanitation system in Kampala, Uganda.

512 4:00 pm W

Metagenomic Study of Wastewater and Advanced Water Treatment Systems for Indirect Potable Reuse: Insights for Engineering

Arnold Wong, Environmental Engineering (M)

There are currently several large-scale projects in Southern California, in various stages of development, that will eventually provide indirect potable reuse of wastewater via surface water augmentation. In these systems, tertiary treated wastewater is sent to an advanced water treatment facility, then discharged to surface reservoirs for storage, where it will mix with other water sources before being further treated for potable use. The operation of the advanced treatment process has been tested at several 1 MGD demonstration facilities. We used metagenomics to study changes in the microbial population throughout the system at one of these demonstration facilities. Specifically, we analyzed the metagenome of the following samples: 1) untreated wastewater; 2) mixed liquor; 3) secondary clarified effluent; 4) tertiary-treated water; 5) ozonated tertiary water; 6) biological activated carbon (BAC) biomass; 7) BAC filtrate; 8) ultrafiltration membrane filtrate; 9) reverse osmosis (RO) product water; and 10) final effluent (RO product water further treated with UV and advanced oxidation). Microorganisms were concentrated from original sample volumes of up to 100 liters down to 500 mL using tangential flow filtration with a 100 kDa hollow fiber cartridge, then retained on a 0.2-micron filter unit. Commercial kits were used for DNA extraction and library preparation. Shotgun metagenomic sequencing was conducted on the Illumina MiSeq sequencer. The average read length was 280 bp, and there was an average of 1.8 million reads per sample (500 million bp) for all samples except for the RO product water and the final effluent which had 206 and 4 reads, respectively. This presentation will focus on the insights that can be obtained with regard to the engineering design and operation of these advanced water treatment systems. We are particularly interested in the microbial community detected on the biological activated carbon filter, to better understand its role in the degradation of aromatic compounds.

Session E-5

Poster Biological and Agricultural 10
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

513 4:00 pm X

The Effect of Hyperinsulinemia on Tumor Cell Growth

Bayan Almasri, Microbiology with Clinical Lab Science emphasis (U)

Background: Chronically elevated insulin concentrations have been associated with several cancers including breast cancer. Literature shows high fat diet (HFD) promotes tumor progression and reduced calorie intake improves several metabolic adaptions, including reduced insulin levels and reduction of cell proliferation. Preliminary results show time restriction feeding (TRF), a regimen of eating during a specific period in normal circadian feeding cycle, without calorie restriction, can reduce tumor growth and improve metabolic regulation in obese post-menopausal breast cancer mice. The mechanism behind this phenomenon is hypothesized to be insulin regulation.

Objective: Determine the mechanism behind TRF by testing how differing insulin concentrations have an effect on tumor growth both in vivo and in vitro.

Methods: To test the effect of insulin in vivo, mice were put on a HFD to cause obesity and hyperinsulinemia. Around the same starting weight, breast cancer cells were injected in the memory fat pads and after three weeks of injection, mice were grouped into HFD, HFD with Diazoxide, HFD with insulin pumps. The mouse weight, fasting glucose levels, tumor

weight, and tumor volume were measured. In an alternate approach, mice on normal chow diet had insulin pumps implanted subcutaneously and fasting glucose levels, tumor weight, and tumor volume were measured. To test the effect of insulin in vitro, breast cancer cells were studied through colony formation, spheroid formation, migration, and invasion assays, to test the effect of differing insulin concentrations on cancer cell growth.

Results: In vivo studies demonstrated that mice with hyperinsulinemia have increased weight, glucose levels, tumor growth, and tumor volume. In vitro studies demonstrated that increased insulin concentrations result in increased colony formation, spheroid size, cells migration rate, and invasion rate. We conclude that increasing insulin concentration results in increased cell proliferation and TRF improves metabolic deregulation and reduces mammary tumor growth in obese postmenopausal mice and imply that these effects are insulin-dependent.

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514 4:00 pm Y

Discovering the role of long non-coding RNAs during pancreatic differentiation of human embryonic stem cells using dCas9 technology.

Shania Westmoreland, Biology (U)

From ultra-deep RNA sequencing studies, non-coding RNAs (ncRNAs), including long non-coding RNAs (lncRNAs), have been identified throughout the human genome. lncRNAs are thought to play roles in embryonic development, dosage compensation, disease regulation, immune response and cell regulation. Through a small number of studies on specific lncRNAs, it has been demonstrated that lncRNAs can operate through diverse mechanisms. However, only a small fraction of known lncRNAs have been thoroughly studied and characterized. Recent advances in CRISPR technology has enabled programmable control of gene expression for studying gene function. The nuclease dead CRISPR-Cas9 (dCAS9) enzyme can be directed to the promoter of a specific target genes to either block the initiation of the transcription (CRISPRi), or, when fused to a transactivator domain (e.g. VPR), to promote transcriptional initiation (CRISPRa). However, many of the existing CRISPRi/CRISPRa systems do not work well in hESCs due to gene silencing. This study aims to optimize these systems in hESCs to determine the functions of lncRNAs during pancreatic differentiation. Using a TALEN assisted gene-trap, doxycycline-inducible dCAS9 and dCAS9/VPR constructs were integrated into the “safe harbor” AAVS1 locus. hESC clones carrying the correct integration of the construct into the AASV1 safe harbor without random integration events were identified. Induction of dCas9 mRNA and protein expression in undifferentiated and differentiated hESCs was used to select optimal clones. Constructs for constitutive expression of guide RNAs (gRNAs) targeting the promoters of lncRNAs and transcription factors (TFs) differentially expressed during pancreatic differentiation were introduced into these clones. Using this system, we are able to overexpression and knock-down selected target transcripts in undifferentiated hESCs. Ongoing studies are designed to disrupt or promote gene expression at specific time points during differentiation and study the effects on the differentiation process. In addition to delineating the functions of the specific lncRNAs and TFs targeted in these experiments, this study aims to develop a more robust system for programmable manipulation of gene expression in hESCs, particularly during directed differentiation.

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515 4:00 pm Z

Developing a cell-based assay to monitor proteolysis of the Chikungunya virus capsid to facilitate the discovery of potential antivirals

Alex Escobar, Cellular and Molecular Biology (M)

Myalgia (muscle pain) and arthralgia (joint pain) are the main symptoms of Chikungunya fever, a disease caused by the Chikungunya virus (CHIKV). Originally found in Africa, CHIKV is transmitted by mosquitos who are aided by climate change, helping the new spread of CHIKV and other arboviruses worldwide. Since its dramatic appearance in the Americas in 2013, two million cases have been reported worldwide with deaths appearing in Brazil more recently. This positive strand RNA virus is a member of the alphavirus genus within the Togaviridae family. Because there are currently no vaccines or antiviral drugs against CHIKV, tools that facilitate drug discovery and a better understanding of the CHIKV life cycle are essential for preventing further epidemics. Our overall objective is to elucidate the requirements for the full proteolytic activity of the CHIKV capsid protease. This protease is crucial for the CHIKV life cycle and thus considered a prime target for the development of antivirals. In order to monitor CHIKV CA-PR activity, we have adapted a cell-based assay previously developed for the HIV-1 protease to CHIKV CA-PR. In the assay, the green fluorescence protein reporter gene serves as biosensor for CA-PR activity, and is observed only when the protease is inactive or inhibited. We hypothesize that through the use of this assay in a high throughput manner, we will identify potential antivirals that inhibit CA-PR. We have engineered a set of CA-PR constructs to observe CA-PR activity in different forms to understand the importance of certain amino acids and protein domains that will serve as controls for potential screens. Our flow-cytometry and western blot analysis show clearly that we have successfully expressed both wild type and mutant counterparts of CA-PR in mammalian cells. With our cytology techniques, we are able to visualize fully, partially, and non-active CA-PR, broadening our knowledge on the requirements needed for full CA-PR proteolytic activity. By monitoring the activity of CA-PR in mammalian cells in this robust manner, we hope to facilitate the discovery of antivirals targeting CHIKV to stop an emerging pandemic.

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516 4:00 pm AA

A Bioinformatics Approach for Dengue and Zika Virus Substrate Discovery

Majid Salami, Bioinformatics (M)

Dengue (DenV) and Zika virus (ZIKV) are two of the most important human viral pathogens. Understanding how these viruses affect the host at the biological level is crucial in order to find new cures to eradicate infection. In such an attempt we have undertaken a bioinformatics approach aimed at finding potential substrates of the viral proteases within the human proteome. Viral proteases, considered one of the main targets for antivirals, cleave both viral and host proteins. In order to reveal the host substrates, we created a set of bioinformatics search parameters that take into account sequences within the viral proteome known to be cleaved by the viral proteases. These include the boundaries between Capsid and non-structural protein (NS) 2A (CA/NS2A), NS2A/B, NS2B/3, NS3/4A, NS4A/B and NS4B/5, the sequences of which were obtained using reliable, peer-reviewed, published and openly available data from the NCBI site. We take into account the degree of interchangeable amino-acids in each position, length of cleavage recognition site and relative position of cleavage within the site. Preliminary searches for the main four serotypes of DenV and for ZIKV led to a long list of hits that we have compiled in tables for the individual search parameters; 808 hits for the DenV serotypes and 58 hits for the 2015 ZIKV. This preliminary list contains all hits including their isoforms. We are now in the process of defining the singlets which should account for the unique protein sequences. For instance we found EIF4G1, a protein required for protein translation, already described in literature as being cleaved by ZIKV, validating our approach for substrate discovery. Importantly, we have also found hits that have not yet been described, such as Myomesin, involved in the structure of filament cytoskeleton. Our lab has the unique opportunity to assess if putative substrates found in silico are indeed cleaved by the virus. This will be done utilizing the cellular platform developed to monitor cleavage. In summary, by linking our bioinformatics approach with biological assays we will reveal the biological significance of our findings in an attempt to fight DenV and ZIKV infection.

517 4:00 pm BB

Coupling of two cell-based screens to reveal potential antivirals against Dengue virus

Danielle Slemons, Cell and Molecular Biology (M)

Many viruses require proteolytic cleavage for maturation and full protein activity, making their proteases obvious targets for antivirals. Our lab previously developed a cell-based assay that monitors viral protease (PR) activity focusing on HIV-1 PR as proof of principle. The assay is based on the inducible expression of PR fused within the Gal4 DNA-binding and transactivation domains. The fusion protein binds to the Gal4 responsive element and activates the green fluorescent protein (GFP) downstream reporter only in the presence of an effective PR inhibitor. For Dengue virus (DenV), the causative agent of DenV Shock Syndrome and Hemorrhagic Fever, there are currently no antivirals available. We have adapted the HIV-1 PR assay to the DenV PR non-structural protein 3 (NS3), a serine PR that requires a co-factor (NS2B) for enhanced proteolytic activity and proper folding. NS2B has four transmembrane domains (TM), two on either side of a hydrophilic cytoplasmic-exposed region. To monitor the activity of DenV PR in the context of the assay (referred to as cytosolic assay) we removed the NS2B TMs to allow the fusion protein to travel to the nucleus. We have thus engineered a wild type and mutant NS2B/NS3, and compared full-length with delta-TM counterparts. Flow cytometry and western blotting corroborated activity and thus lack of fluorescence only with the wild type PRs. As the assay is ultimately intended for drug discovery, we have also developed a secondary assay as a counter screen. This assay utilizes Gal4 and GFP in a novel manner, where rather than deleting the TMs of NS2B, we exploit them to anchor PR in the Endoplasmic Reticulum membrane. This assay, referred to as anchored assay, relies on an intact Gal4 downstream NS2B/NS3 and a well-known NS3 cleavage site. Gal4 is released upon cleavage, activating GFP only with active PR. We have recently obtained cell lines for the cytosolic assay and we are now developing similar clones for the anchored assay. The combination of assays with opposite readouts (appearance of fluorescence with the mutant or wild type PR in the cytosolic or anchored assay, respectively) increases the potential of finding inhibitors in future screens.

518 4:00 pm CC

Development of a Platform that Monitors Cleavage During Transport to and at the Cell Surface

Francesca Ventola, Cellular and Molecular Biology (M)

Many viral proteins are processed by cellular proteases as they travel through the classical secretory pathway involving the Endoplasmic Reticulum (ER)/Golgi/Trans-Golgi Network. This is exemplified by the HIV envelope (Env) protein. Other proteins are rather cleaved at the cell surface, further proving the importance of the secretory pathway for biological processes. We have thus embarked in a biotechnological approach to monitor cleavage within the classical secretory pathway and at the cell surface. Resistant strains and the side effects of drugs against HIV-1 lead us to develop an assay to facilitate the discovery of novel antivirals. The Env polyprotein gp160 is processed into gp120 and gp41 by the host protein convertase, Furin, in the Golgi. Our assay includes 17 amino-acids of the gp120/41 boundary embedded within a scaffold protein that is targeted to the ER and is flanked by HA and FLAG tags. On its way to the cell surface the FLAG tag is removed by Furin. We utilize microscopy and flow cytometry to monitor whether Env is cleaved or not based on the presence of one or two tags at the cell surface.

Here we have further developed the two-tag system that monitors cleavage intracellularly for the monitoring of proteolytic events that specifically occur at the cell surface or extracellular matrix (ECM). Proteolysis at the ECM plays a significant role in cancer progression, metastasis, and other diseases. This is exemplified by Matrix Metalloproteinase 14

(MMP-14). For that purpose, we have replaced the HIV Env boundary with an optimized MMP-14 substrate. In order to prove cleavage by MMP-14, we concomitantly expressed the MMP-14 enzyme. Flow cytometry data shows a dramatic reduction in FLAG expressing cells only in the presence of MMP-14. To further prove cleavage at the cell surface we have performed mixing experiments with two separate populations of cells either expressing MMP-14 or the substrate. By mixing substrate-expressing cells with increasing MMP-14-expressing cells, we observed a reduction in the expression of the FLAG tag, demonstrating a cleavage event at the cell surface. We are currently adapting both assays to obtain a high-throughput platform for screening.

Session E-6

Poster Health and Nutrition & Clinical Sciences 6
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

519 4:00 pm DD

Depression and Stomach Acid Load

Patrick Montine, Epidemiology (M)

Objective and Hypothesis: The object of this study is to determine the associations between dietary acid load and depression among breast cancer survivors. We hypothesize that dietary acid load is positively associated with increased depression.

Methods: Using a cross-sectional design, we analyzed data collected from 3088 breast cancer survivors enrolled in the Women's Healthy Eating and Living (WHEL) Study who had provided detailed four randomly selected self-reported 24-hr dietary recalls over a three-week period and answers questions related to depression. Two commonly used dietary acid load scores were created, namely the potential renal acid load (PRAL) score and net endogenous acid production (NEAP) score. The PRAL score takes into account the intestinal absorption rates for contributing nutrient ionic balances for protein, potassium, calcium and magnesium and the dissociation of phosphate at pH 7.4. The NEAP score uses total protein and potassium intake as the main components involved in acid production. The PRAL and NEAP were categorized into quintiles.

Results: Compared to the lowest quintile, women with PRAL at quintile 2, 3, 4, and 5 had OR =1.07 (95% CI, 0.85-1.34), OR=1.26 (95% CI,1.01-1.59), OR=1.06(95%CI,0.85-1.34), and OR = 1.20 (95%CI, 0.95-1.51), respectively after adjustment of age and other covariates. The association between NEAP and depression was not statistically significant.

Conclusion: The associations between dietary acid load and depression was not statistically significant. However, this is a cross-sectional study, longitudinal study examining the association between dietary acid load and depression is warranted.

520 4:00 pm EE

Red meat and Inflammation and A1c in Breast Cancer Women

Brandon Khuu, Public Health - Epidemiology (M)

Objective:

To determine the associations of processed and unprocessed red meat with serum C-reactive protein (CRP) and hemoglobin A1c (HbA1c) among breast cancer survivors. We hypothesized that processed and unprocessed red meat can increase CRP and HbA1c.These associations will not be completely mediated by body mass index (BMI).

Methods:

Using a cross-sectional design, we analyzed data collected from 3,088 breast cancer survivors who enrolled in the Women's Healthy Eating and Living (WHEL) Study and had provided four detailed 24-hour dietary recalls over a 3-week period along with a blood sample to validate dietary pattern and measure plasma CRP and HbA1c from washed red blood cells. Intakes of processed and unprocessed red meat were extracted from dietary recalls. CRP concentrations were measured using high-sensitivity electrochemiluminescence assay. HbA1C was measured using ion exchange high-performance liquid chromatography.

Results:

We found significant positive associations for both unprocessed and processed red meat with plasma CRP and HbA1c. In multivariable adjusted models, compared to women with the lowest quintile intakes of unprocessed red meat, women with highest quintile had a 19% increase of CRP and had an 11% increase of HbA1c after adjustment for BMI. Further adjustment for total vegetable intake did not materially change these associations. We observed similar patterns for processed red meat. The magnitudes of the associations of processed red meat with CRP and HbA1c were similar to that of unprocessed meat with CRP and HbA1c after adjustment of BMI. P-values for trends were less than 0.002 for all of these associations.

Conclusions:

CRP and HbA1c are strong predictors for breast cancer prognosis and development of comorbidities (e.g. diabetes). Although many studies examined the association of red meat with CRP and HbA1c in general healthy population, few studies were conducted among breast cancer survivors. Our results for the first time demonstrate that the positive associations between unprocessed and processed red meat consumption and inflammation and hyperglycemia are not fully mediated by BMI among breast cancer women.

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521 4:00 pm FF

Association between Dietary Acid Load and Inflammatory Biomarkers in Breast Cancer Patients

Phoebe Seaver, Epidemiology (M)

Objective:

To determine the associations between dietary acid load and serum C-reactive protein (CRP) and hemoglobin A1c (HbA1c) among breast cancer survivors. We hypothesized that high dietary acid load is positively associated with CRP and HbA1c.

Methods. Using a cross-sectional design, we analyzed data collected from 3088 breast cancer survivors enrolled in the Women's Healthy Eating and Living (WHEL) Study who had provided detailed dietary intakes through 24-hr recalls and plasma measures of CRP and HbA1c.

We found positive associations between dietary acid load and plasma CRP and HbA1c. In multivariable adjusted models, compared to women with the lowest quartile, women with the highest quartile intakes of dietary acid load had a 30% increase CRP and a 6-9% increase of HbA1c after adjustment of total calorie intake, age, body mass index, stage of breast cancer, hormone receptor status, type of chemotherapy and other covariates.

Conclusions: Our results for the first time demonstrate that positive associations between dietary acid load and CRP and HbA1c exist in breast cancer patients. Our study identifies a novel dietary factor that may lead to inflammation and hyperglycemia, both of which are strong risk factors for breast cancer recurrence and other comorbidities.

522 4:00 pm GG

ABO type as a predictor of efficacy in Immunotherapy

Kasim Hakimi, Kinesiology Pre-Physical Therapy, Biology (U)

Background: Immunotherapy is becoming a popular treatment for several metastatic cancers and its effects have changed survival rates noticeably. However, not every patient's response to therapy is successful. With recent discoveries regarding specific microbiome composition in immunotherapy recipients and the overall effectiveness of the therapy, it is important to solidify a link between the two. A unique way a microbiome can vary is dependent on blood type an individual possesses. Our goal is to assess whether there is any similarities and differences in therapy responses with various blood types. Methods: Patients medical history from EPIC database which is under IRB protocol Immunoscape was abstracted and reviewed. Imaging summaries from CT, MRI, PET scans were reviewed in order to evaluate cancer progression. Statistical analysis was performed to discover correlation between ABO blood group and progression free survival/ immune-related adverse events in immunotherapy patients. Results: 51 % of patients with O+ blood type had immune-related adverse events. The most common toxicity was dermatologic and mucosal. Conclusions: Based on our results physicians can prescribe topical creams for O+ patients before they undergo treatments in order to reduce dermatological complications and unnecessary patient visits to clinics.

523 4:00 pm HH

Glycemic Responses to Overground Bionic Ambulation for Spinal Cord Injury

Monique Rashid, Kinesiology emphasis prephysical therapy (U)

Walking is a common way to stimulate cardiorespiratory and metabolic activity. Many individuals with spinal cord injury (SCI) have ambulatory deficits and are prone to elevated postprandial blood glucose (PBG), which is an independent predictor for cardiometabolic diseases such as diabetes. Overground bionic ambulation (OBA) acutely increases metabolic rate and cardiorespiratory responses, with unknown glycemic effects. The purpose of this study is to determine if OBA is effective in blunting PBG in individuals with SCI. Methods: Two female participants with chronic motor-incomplete SCI. Participant 1 (P01) was 31 years old, 170 cm, 57 kg, with a T2 injury for 15 years. Participant 2 (P02) was 26 years old,157cm, 45 kg, with a C5 injury for 4 years. Participants completed an upper-extremity maximal exercise test and four two-hour oral glucose tolerance tests. Fasted participants ingested 75g of dextrose solution and sat quietly (control) and exercised in one of 3 different modes for 20 minutes each (OBA, OBA with functional electrical stimulation (FES-OBA) and stationary arm cycling), all on separate days. Respiratory gases were continually collected during the exercise period. Standard glucometer measurements were taken at baseline, 30, 45, 60, 90, and 120 min. Results: For P01, arm cycling resulted in the smallest incremental area under the curve (iAUC, 4886 mg*min/dL) and incremental peak (66 mg/dL). Peak BG occurred at 45min for cycling and 30min for all other conditions. %VO2max for OBA (45%), FES-OBA (61%), and arm cycling (69%) corresponded to light, moderate, and vigorous intensity, respectively. For P02, FES-OBA resulted in the smallest iAUC (7226 mg*min/dL) and incremental peak (81 mg/dL). Peak BG occurred at 90min for OBA and FES-OBA, and at 60min for cycling and control. %VO2max for OBA (76%) and FES-OBA (70%) corresponded to vigorous intensity, whereas arm cycling (42%) was light intensity. Conclusion: 20 minutes of FES-OBA decreased PBG for both participants while OBA alone had little effect on PBG. Arm cycle results were mixed, likely due to level of injury differences (i.e., cervical vs thoracic) in upper extremity strength and function. FES-OBA has the potential to improve PBG in people with SCI.

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524 4:00 pm II

Short Exercise Intervention using Data Acquisition Air Pressure Pillow (DAQ APP): A Pilot Study for CKD Patients

Melissa Ruiz, Public Health (U)

Chronic Kidney Disease is defined as kidney damage, compromised renal function, or a GFR <60 mL/min per 1.73m^2 for at least three months. In this study, based off other experiments with exercise interventions with CKD patients, we designed a protocol for an exercise program with the DAQ Air Pressure Pillow to test knee extensor strength. Subjects were recruited to participate in a 2-week exercise intervention. Subjects completed three sets of 15 leg press repetitions, three times per week. It was determined that participant leg extensor force before and after the exercise intervention was positively and strongly correlated (r=.908, p<.001). However, there was no significant difference between leg extensor force before and after the intervention [t(9)=.468, p=.651). We were able to ensure the safety and feasibility of the DAQ APP and intend to apply the knowledge we gained about our exercise intervention to a subsequent study with stages 3 through 5 CKD.

525 4:00 pm JJ

Postural control deficits with Progressive Supranuclear Palsy

Kathleen Dillon, Kinesiology (U)

Progressive Supranuclear Palsy (PSP) is an atypical degenerative Parkinsonian disorder affecting the basal ganglia and brainstem. Cardinal signs include muscle weakness, occulomotor impairments, difficulty speaking, trouble swallowing, imbalance and lack of coordination. Postural control assessments using force platforms can provide an objective window to a disease mostly studied subjectively. These measurements can also be used to distinguish postural sway signatures unique to PSP from other Parkinsonian disorders. Therefore, the purpose of this study was to determine postural control deficits accompanying PSP and idiopathic Parkinson's disease (PD). 6 PSP (61-80 years), 12 PD (66-84 years) and 12 older adults (OA; 60-85 years) volunteered to participate in the study. All subjects performed a static balance assessment using a portable force plate. All testing consisted of 3 trials each of quiet unperturbed standing with eyes closed and eyes open; feet shoulder width apart and hands on the hips. Each trial lasted 20 seconds during which the total center of pressure (COP), COP antero-posterior (AP), and COP medio-lateral (ML) sway displacements were calculated. A principle component analysis was used to calculate the 95 and 99% confidence intervals (CI) of the area within which the COP would lie. Furthermore, changes in low-frequency postural oscillations were quantified by examining the absolute wavelet power in 3 frequency bins from 0-4 Hz. We find that low frequency oscillation in postural sway vary differentially with removal of vision (eyes closed) and disease. Furthermore, these postural oscillations increase with increasing fall-risk. This effect is most profound in the PSP>PD>OA. Furthermore, PSP and PD patients at high fall-risk are highly dependent on vision for postural control when compared with healthy controls and patients at low risk for falls. Most importantly, our findings suggest that non-linear measures of postural sway are more sensitive changes in sensory weighting and pathologies than standard linear measures of postural sway assessment.

Session E-7

Poster Behavior and Social Sciences 18
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

526 4:00 pm KK

BMI and Home Food Availability in Food Insecure Rural Latino Children

Petrona Gregorio-Pascual, School of Public Health (D)

Food insecurity is a significant public health problem in the U.S., especially among Latino children. Children who experience food insecurity are more likely to have lower health status and poorer diets and may be at risk for obesity. The aims of this study were to examine the relationship between food insecurity and body mass index (BMI), expressed as the percent of 95th percentile (%BMIp95) among rural Latino children and the mediating role of home food availability in this relationship. Home food availability was defined as the ratio of frequency of unhealthy (e.g., sugary beverages) over healthy foods and beverages (e.g., vegetables) available in the home environment. This cross-sectional study used baseline data from children and caregivers involved in a multi-level, multi-sector intervention in Imperial County, CA, the California Childhood Obesity Research Demonstration Study. Baseline data included an in-person interview with caregivers and measured height and weight from children. A sample of 1186 children were recruited; this study involved a subsample of 317 children and caregivers who completed additional measures. Nearly two thirds of caregivers reported child food insecurity. On average, healthy foods and beverages were sometimes available (M = 3.2, SD = 0.56), while unhealthy foods were rarely available (M = 2.5, SD = 0.64) on a scale of 1 to 5. The mean ratio of unhealthy to healthy foods and beverages was 0.81(SD = 0.25). Multiple linear regression analyses were used to investigate the hypothesis that home food availability mediated the effect of food insecurity on children's %BMIp95. After controlling for several socio demographic variables, results indicated that food insecurity was not significantly associated with children's %BMIp95. However, food insecurity was significantly associated with home food availability, such that children who were food insecure were more likely to have frequent availability of unhealthy compared to healthy foods and beverages. Lastly, there was no significant relationship between home food availability and child %BMIp95. Greater

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effort should be made to connect caregivers from households with food insecure children to food banks and food pantries to increase their access to healthful foods and beverages.

527 4:00 pm LL

Measuring Military Mental Health Providers' Comfort and Proficiency in Assessing Suicide: Psychometric Properties of Two Novel Scales

Summer Reames, Master's of Public Health - Epidemiology (M)

Introduction: Each day, about 20 veterans and service members die by suicide. Research shows that mental health providers do not feel adequately prepared in suicide assessment and management techniques. It is critical to quantify providers' levels of comfort and proficiency in working with suicidal patients so that training programs and continuing education can better prepare providers to work with these high risk patients. The purpose of this study was to examine the psychometric properties of two novel scales designed to assess provider comfort and proficiency in working with patients at high risk for suicide.

Methods: Two 15-item scales were designed to assess comfort and proficiency levels among providers in managing and treating suicidal patients. Each scale was designed to assess 6 core competencies (CC) for working with suicidal patients for mental health care providers published by the American Association of Suicidology (AAS). A sample of military mental health providers (n=30) were surveyed. The psychometric properties of the two scales were examined by conducting a Principal Components Analysis (PCA) and examining internal consistency and convergent validity.

Results: The mean age of participants was 40.13±10.9; most were female, (63.3%) and had a graduate degree (77.7%). Mean scores were computed for both the comfort and proficiency scales (3.11±0.54 and 3.12±0.49, respectively; range: 0-4). Both scales had high internal consistency (comfort α=0.905, proficiency α=0.912). A PCA was conducted to determine if the 6 CC sub-constructs were captured by the scales. Results indicated that the comfort scale included five sub-constructs, while the proficiency scale included three (Eigen-value >1). Correlations were assessed between the scales and the number of patients seen weekly (comfort: r=0.338; proficiency: r=0.354), the number of mental health patients seen since they graduated (r=0.314), and history of patients who attempted suicide (r=0.460) to examine convergent validity.

Conclusions: Results indicate that the scales did not capture all CCs. This suggests that modifying these scales by rewording or adding new items may be more appropriate when assessing provider-level comfort and proficiency. We propose that additional research be done to validate these scales.

528 4:00 pm MM

Factors related to male partner involvement in elimination of mother-to-child transmission of HIV in rural Uganda

Katherine Schmarje, Public Health, Global Health (D)

Introduction

In 2017, 95,000 children aged 0-14 were living with HIV in Uganda1, 7,600 of which were new infections.2 Mother-to-child transmission (MTCT) is responsible for almost all new HIV infections in children. The prevalence of MTCT remains high in sub-Saharan Africa. Specifically, 90% of all newly infected children in 2017 resided in sub-Saharan Africa.3 Elimination of mother-to-child transmission (EMTCT) is an intervention aimed at preventing vertical transmission of HIV and has been found to reduce transmission rates to less than 5%.4 In general, EMTCT efforts focus primarily on women, yet male partner involvement (MPI) has been positively associated with the uptake of the EMTCT care continuum including improved condom use, maternal hospital delivery, and utilization of EMTCT services,5 all of which contribute to a reduced risk of vertical transmission and infant mortality.6

Objectives

Characterize the level of MPI in EMTCT in Jinja District

Identify individual and socio-cultural factors influencing MPI in EMTCT

Methods

Cross sectional data were collected from HIV positive mothers attending postpartum EMTCT clinics in Jinja District, Uganda (n=192). Women reported information about their male partner's involvement in their EMTCT. Mean MPI was then assessed using a 12-item scale.

Results

The overall mean MPI score found in Jinja District was low (1.57 on a 0-3 scale). HIV status disclosure and male partner's monthly income were significantly associated. Compared with women who disclosed their HIV status, those who did not had a reduced mean MPI score by 1.307 (95%CI -1.545, -1.069). For every 10 USD increase in monthly income, mean MPI score increased by 0.047 (95%CI 0.012, 0.081).

Conclusion

Disclosure of a woman's HIV status to her partner plays a large role in his level of involvement in EMTCT care, thus safe HIV status disclosure should be encouraged by healthcare workers when possible.

529 4:00 pm NN

Scope Review of Bear Literature and Popular Press to Address Issues of Racism and Weightism in then Community

Cameron Wadstrom, Public Health (U)

Within the larger gay community, the bear counterculture aims to reject conventional beauty standards (of lean muscularity, smooth skin [lack of body hair], and ageism) surrounding

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desirability among gay men. Bears-- typically older, larger bodied, hairy, gay men-- have established their own community in queer space and hold significant cultural presence. This population roots its strategy in navigating identity politics through the lens of body acceptance and inclusivity. However, there is emerging critique by members of the gay and bisexual community (e.g., in popular press; sociological literature) that bear spaces and recent representations of bears are lacking in diverse representation (e.g., with regards to race and ethnicity, weight). To more formally explore the evidence underlying these critiques, we conducted a scope review of existing, peer-reviewed behavioral health and sociological academic journals as well as media and popular press pieces (magazines, websites, bear materials) published between 1979 and 2018. The purpose of this investigation was to evaluate if there is a substantial prevalence of racism, weightism, and other forms of bias within the bear community. Some of the preliminary literature review not only revealed internalized sentiments of weightism amongst self-identifying bears but that this resentment towards themselves (due to lack of adherence to conventional beauty features) leads to more intense, potentially dangerous sexual behaviors. In regards to race, several pieces of popular press elaborated on how members of the community believe bear spaces were created for white men, leaving people of color isolated and invisible. Analysis of the literature and available media reveals the need for more in-depth research in order to address whether or not the bear community disregards issues of race and weightism in their communal narrative. Findings provide guidance for more rigorous content analysis of bear representations in media.

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530 4:00 pm OO

The Process of Piloting Youth Participatory Action Research with LGBTQIA+ Youth in Middle and High Schools

Fitri Wijaya, Public Health (M)

LGBTQIA+ youth face a number of daily stressors, particularly in the school environment, due to their minority sexual orientation and/or gender identities; yet they are resilient, utilizing resources and community support to promote positive outcomes. Youth participatory action research (YPAR) is a tool that encourages youth to identify issues that they are passionate about and participate in action research to create positive impact within their communities by collecting, analyzing, and utilizing data to inform meaningful change. YPAR aims to increase positive development in youth by providing the skills and tools necessary to create systems-level change, empower youth to develop critical thinking skills, increase autonomy, and engage civically in the process. The goal of this study was to pilot YPAR within middle and high schools and engage school-aged LGBTQIA+ youth in research within their community to impact change. This poster presents the process of establishing the YPAR pilot study. Students within Gay-Straight Alliances (GSAs) ages 12 to 18+ years old of all genders and sexual orientation identities within 3 participating schools were invited to participate in the pilot. Students were trained in YPAR methods and provided the opportunity to design a research study and take action on an issue affecting LGBTQIA+ students at their school. An in-depth mixed methods evaluation portion of the YPAR process (short surveys and interviews) with consenting project participants examines how engagement in YPAR contributes to their sense of self, leadership, and community engagement. The three participating GSAs have a total of of 23 students participating in YPAR, and 6 students involved in the evaluation portion of the pilot. Current project topics include bathroom safety, inclusive sexual health education, and bullying. Each GSA is currently in a different stage of problem identification/ discussion and data collection in their YPAR project, utilizing both quantitative (observation checklist and survey) and qualitative (interviews) methods for their data collection.

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531 4:00 pm PP

Thirdhand Smoke and Cancer: Are Children at Risk?

Alejandro Reyes, Interdisciplinary studies: Public Health, Psychology, Communications (U)

Purpose: To identify whether children (≤ 18 years) are at risk of thirdhand smoke exposure

Background:

Thirdhand smoke (THS)

§Mixture of toxic chemicals from secondhand smoke (SHS) left in the environment

§THS residue reacts with nitrogen in homes, from kitchen stoves and ovens

•Forms tobacco specific nitrosamines (TSN); some are carcinogenic

§Recent studies have shown that effects of THS are similar to those of SHS

§Nicotine is one of main toxic chemicals found in tobacco smoke

•Clings to surfaces in the home

•When ingested, it is metabolized into cotinine

•Cotinine level in urine is used as a biomarker for THS exposure

§THS exposure occurs through inhalation, ingestion, and dermal contact

Children and THS

§Risks presented by THS are unclear

Methods:

A literature review was conducted to identify if THS poses a risk to children

Literature review search strategy

§Databases used: PubMed/MEDLINE, CINAHL, ERIC, and PsycINFO

§Key words used: THS, health effects, SHS, TSN, children

Inclusion criteria

§Abstract included key words

§Peer reviewed article

Results:

6 relevant articles were identified

Exposure to THS poses serious health risks for developing

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children because:
§100 times more sensitive to house pollutants than adults
§Increased respiration relative to small body size
§Immature capacity to metabolize toxic chemicals
§Spend a lot of time inside the home and on the floor
•Where THS collects on surfaces, such as carpet, upholstery, mattresses,
Children are involuntarily exposed to THS
§Children with outdoor-smoking parents were 5 – 8 times more exposed to THS than those with non-smoking parents
§Children with indoor-smoking parents were 2 – 6 times more exposed than those with outdoor smokers
Effects of THS on children
§Neurobehavioral disorders, especially for 9 – 11 year old children living in poverty
§Short- and long-term health problems throughout life course
Discussion:
§Children are susceptible to exposure to THS and vulnerable to the effects of THS
§Few studies have focused on THS; even fewer on the effects of THS on children
§There is no clear method to remove THS from the environment and indoor surfaces
§Exposure to THS among children is a public health problem that requires further research and attention

Session E-8

Poster Behavior and Social Sciences 19
Friday, March 1, 2019, 4:00 pm
Location: Montezuma Hall

532 4:00 pm QQ

Prenatal THC Exposure Impairs Motor Coordination in Rats

Ivette Gonzalez, Psychology (U)

Tetrahydrocannabinol (THC) is the psychoactive component of marijuana, but the effects of THC on fetal development are not well understood. This is of great concern, as cannabis is the most commonly used illicit drug amount pregnant women. Thus, understanding how prenatal exposure to THC affects brain and behavioral development is critically important. Not only is this a public health concern, but over half of pregnant women who report consuming cannabis also report consuming alcohol. However, the effects of prenatal cannabis exposure, alone and the combination of prenatal exposure to alcohol and cannabis on behavioral development are not known. With the release of electronic cigarettes (e-cigarettes), cannabis consumption via e-cigarette use (vaping) has become popular among pregnant women, as they view vaping as safer than traditional smoking. Using an animal model, the current study examined the effects of prenatal ethanol, cannabis, or combined exposure via vapor inhalation on motor coordination among the offspring. Pregnant Sprague-Dawley rats were exposed to ethanol (EtOH, 68 mL/hour) and vehicle (propylene glycol), or Tetrahydrocannabinol (THC 100 mg/mL) vapor during gestational days (GD) 5-20, using a 2 (EtOH, Vehicle) x 2 (THC, Vehicle) design. On postnatal days 30-32, one male and one female offspring from each litter were examined on a parallel bar motor coordination task, a task that requires both balance and fine motor coordination, as subjects traverse 2 parallel bars to get to a platform. As subjects are successful, the maximum width between rods is increased, making the task increasingly more difficult. Preliminary results show subjects exposed to THC, with or without EtOH were impaired on this task, less successful at traversing and only able to traverse smaller widths between rods. Surprisingly, prenatal ethanol did not impair performance. These data suggest that even low levels of prenatal THC can lead to long-lasting disruptions in motor performance.

533 4:00 pm RR

A Rodent Model of Prenatal Alcohol and THC Vape Exposure

Samirah Hussain, Psychology (M)

It has been well established that prenatal alcohol exposure can lead to a range of developmental deficits, known as fetal alcohol spectrum disorders. However, little is known of the consequences of prenatal cannabis exposure, even though pregnant women are more likely to consume cannabis than any other illicit drug. With recent legalization of cannabis in many states, the use of prenatal cannabis use is growing in this population (3-4%). Moreover, the popularity of e-cigarettes to consume cannabis (vaping) is also increasing and many pregnant women believe that vaping is safer than traditional smoking. In fact, over half of pregnant women who report consuming alcohol report consuming cannabis as well. To determine the effects of prenatal exposure to cannabis vaping, alone or in combination with ethanol, we developed a vaping model for rats. The present study examined how exposure to these drugs affects maternal body weight, temperature, and food/water intake of the pregnant dam. Thus, the current study exposed pregnant rats (Sprague-Dawley; n=19) to ethanol (EtOH [68 mL/hour], or control [air]), and THC (100 mg/mL) or a vehicle (propylene glycol), or a combination via vapor inhalation (e-cigarettes). The rats were exposed to vapor inhalation from gestational days (GD) 5-20 for 3 hours (40 min THC exposure); this exposure is equivalent to the first and second trimesters in humans. Maternal body weights, temperatures, and food / water intake were measured daily. Preliminary data indicate that neither drug significantly altered maternal body weight, food, or water intake. Importantly, these data indicate that any effects of ethanol or THC on fetal development would not be related to differences in maternal nutrition. However, pregnant dams exposed to THC did show acute increases in body temperature, illustrating that the THC levels, although low, had significant physiological effects on the dam. This model can help us elucidate of how various THC doses and drug combinations affects fetal development, which has important implications for understanding the potential teratogenic effects of cannabis.

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534 4:00 pm SS

Developmental Alcohol Exposure and Choline Supplementation Alter Hippocampal Cytokines in Rats

Samuel Deck, Psychology (U)

Prenatal alcohol exposure can lead to a spectrum of deficits known as Fetal Alcohol Spectrum Disorders (FASD), which can include long-lasting physiological and behavioral impairments related to the hippocampus. For example, individuals with FASD are more susceptible to infections due to a compromised immune system. Choline, an essential nutrient, has been shown to mitigate hippocampal-related behavioral deficits even when given after alcohol exposure has ceased; however, it is unknown if choline supplementation can also mitigate hippocampal inflammation following prenatal alcohol exposure. This study examined whether prenatal alcohol exposure alters immune system functioning and whether choline supplementation mitigates these alterations, using a rat model. Neonatal rat pups were orally intubated with a milk diet containing ethanol (EtOH; 5.25 g/kg/day) or sham intubated from postnatal days (PD) 4-9, a period of development that mimics the human 3rd trimester brain growth spurt. Then, subjects were injected (s.c) with choline (100 mg/kg/ day) or saline from PD 10-30 (human childhood to adolescence). On PD 35, hippocampal tissue was collected to determine cytokine levels; cytokines regulate immune system inflammation and are densely populated in the hippocampus. Developmental EtOH exposure significantly increased IL-6 cytokine levels, which are important for mediating fever responses. In contrast, regardless of EtOH exposure, choline supplementation decreased IL-5 and IFN-γ cytokine levels, which are typically elevated in autoimmune disorders. These data suggest that while choline supplementation did not mitigate EtOH-related increases in cytokine levels, both developmental EtOH exposure and later choline supplementation may influence long-term hippocampal inflammation. However, a current follow-up study is investigating if a challenge to the immune system during adulthood (PD 60) could further elucidate differences between EtOH exposure and choline supplementation groups. Subjects in the follow-up study will additionally receive an i.p. injection of lipopolysaccharide (LPS; 50 ug/kg), an endotoxin, to induce a fever and promote cytokine release. These cytokine levels are currently being analyzed. Together, these studies will help determine if individuals with FASD have a heightened risk of immune-related deficits, and whether choline supplementation could be an effective intervention.

535 4:00 pm TT

The Effects of Prenatal Alcohol and THC Vapor Inhalation Exposure on Early Motor Development in a Rat Model

Bahar Sabouri, Biology (U)

Over half of pregnant women who consume cannabis, a commonly used illicit drug, also consume alcohol. The effects of prenatal alcohol exposure are well established, however less is known about the consequences of prenatal cannabis use. Moreover, the effects of combined use on behavioral development have not been well examined. Pregnant women report believing that using electronic cigarettes (e-cigarettes) to consume cannabis is safer than traditional smoking, although the potential effects of prenatal vapor exposure of cannabis are largely unknown. The present study examined the effects of combined prenatal exposure to alcohol and cannabis via vapor inhalation on early motor development. Pregnant dams received vaporized ethanol (EtOH [68 mL/hour]) or air, THC (100 mg/mL) or propylene glycol vehicle, or combined exposure daily from gestational days (GD) 5-20. Following birth (postnatal day [PD] 0), one sex pair from each litter was tested on early motor development task from PD 12-20 to examine sensorimotor maturation. Pups were suspended by their forefeet from a wire above a cage filled with bedding and given 30 seconds per trial (2 trials/ day) to place its hindlimb on the wire. A successful hindlimb coordination trial was recorded if pups were able to complete this task. If pups held onto the wire for 30 seconds but did not get their hindlimb onto the wire, the trial was recorded as a successful grip strength trial. Based on preliminary results, low levels of prenatal THC, particularly when combined with ethanol, delayed the age when subjects were able to successfully maintain grip strength; prenatal ethanol exposure did not significantly alter the development of this motor skill. These data suggest that low levels of prenatal cannabis exposure may disrupt motor development.

536 4:00 pm UU

The Effects of Prenatal Alcohol and THC Exposure via E-Cigarette on Working Memory in a Rat Model

Cristina Rodriguez, Psychology (M)

Alcohol consumption during pregnancy is known to cause impaired learning and memory outcomes in exposed offspring. In addition, over half of women who report using alcohol during pregnancy also report using cannabis. However, the effects of prenatal cannabis exposure on memory performance have been inconsistent, and even less is known about the effects of combined exposure. Moreover, electronic cigarette (e-cigarette) consumption (vaping) of the primary psychoactive component in cannabis, THC, has become increasingly popular among women of child bearing age; yet, little is known about the developmental effects of vaping during pregnancy. The present study examined the effects of combined prenatal alcohol and THC exposure via vapor inhalation on working memory performance. From gestational days 5-20, pregnant Sprague-Dawley rats were exposed to alcohol (68 mL/hr) or air, as well as THC (100 mg/mL) or propylene glycol, or a combination, via an e-cigarette. Offspring were tested from postnatal days 55-60 (early adulthood) on a working memory task, in which subjects had to locate a hidden escape platform submerged in a water tank which changed locations each session. Within a session, subjects were given a training trial followed by a test trial, with either a 0 sec intertrial interval (ITI; days 1-3) or a 60 sec ITI (days 4-6). Preliminary data indicate that prenatal THC did not affect working memory performance.

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Similarly, there were no effects of prenatal alcohol exposure on working memory based on time and distance to find the platform, although alcohol-exposed subjects did not show improvement in swimming direction compared to controls. Interestingly, ethanol-exposed subjects performed better on the training trails, likely due to less aversion to the center of the tank (where the platforms were) or differences in search strategy. These data suggest that exposure to low levels of prenatal THC does not impair working memory, but that prenatal ethanol alters behavior in the water tank. Further examination is necessary to determine if prenatal ethanol affects emotional behavior or other processes that affect performance on this task. Supported by grant AA025425. Alcohol consumption during pregnancy is known to cause impaired learning and memory outcomes in exposed offspring. In addition, over half of women who report using alcohol during pregnancy also report using cannabis. However, the effects of prenatal cannabis exposure on memory performance have been inconsistent, and even less is known about the effects of combined exposure. Moreover, electronic cigarette (e-cigarette) consumption (vaping) of the primary psychoactive component in cannabis, THC, has become increasingly popular among women of child bearing age; yet, little is known about the developmental effects of vaping during pregnancy. The present study examined the effects of combined prenatal alcohol and THC exposure via vapor inhalation on working memory performance. From gestational days 5-20, pregnant Sprague-Dawley rats were exposed to alcohol (68 mL/hr) or air, as well as THC (100 mg/mL) or propylene glycol, or a combination, via an e-cigarette. Offspring were tested from postnatal days 55-60 (early adulthood) on a working memory task, in which subjects had to locate a hidden escape platform submerged in a water tank which changed locations each session. Within a session, subjects were given a training trial followed by a test trial, with either a 0 sec intertrial interval (ITI; days 1-3) or a 60 sec ITI (days 4-6). Preliminary data indicate that prenatal THC did not affect working memory performance. Similarly, there were no effects of prenatal alcohol exposure on working memory based on time and distance to find the platform, although alcohol-exposed subjects did not show improvement in swimming direction compared to controls. Interestingly, ethanol-exposed subjects performed better on the training trails, likely due to less aversion to the center of the tank (where the platforms were) or differences in search strategy. These data suggest that exposure to low levels of prenatal THC does not impair working memory, but that prenatal ethanol alters behavior in the water tank. Further examination is necessary to determine if prenatal ethanol affects emotional behavior or other processes that affect performance on this task.

537 4:00 pm VV

Social Network Analysis of Online Social Media Data-based Research on Electronic Cigarettes

Taylor Perry, Marketing (U)

Background: Over the past ten years, there has been a spurt in social media data-driven research exploring how conversations about e-cigarettes are organized and disseminated among stakeholders such as e-cigarette users, vendors, companies and regulatory agencies. A review of the most preferred social media platforms among e-cigarette researchers and citation patterns of scholarly work in this area can reveal critical gaps for future work. This research (1) characterized inter- and intra-citation network connections of research articles exploring the topic of e-cigarettes in public health literature that draw data from at least one of the five social media platforms (Twitter, Instagram, YouTube, Reddit, and Facebook), (2) identified adoption trends of social media platforms among researchers exploring the topic of e-cigarettes to inform future inquiries.

Methods: We searched for articles published in Pubmed and PubMed Central that examine e-cigarette related topics and draw data from at least one of the five social media platforms starting 2004. These search criteria yielded 61 articles and 201 corresponding authors. To characterize inter- and intra-citation networks, a heterogeneous multi-network analysis approach was used to create citation ties found to exist among the 61 articles and other articles cited within this sample. To identify adoption trends of social media platforms, a transition matrix was used to illustrate net change scores for all platforms, derived from counts of articles cited in and out of each of the social media platform networks.

Results: Findings reveal that Twitter is the most researched platform, followed by YouTube; Facebook is the least researched platform. Citation analysis demonstrates that articles drawing data from Twitter were mostly cited within-group compared to other social media platforms, whereas those associated with Reddit are mostly cited outside of the network. Lastly, network of articles drawing data from Twitter demonstrated highest clustering, followed by the YouTube network.

Conclusions: A network analysis approach provides a means to reveal under-researched platforms among e-cigarette researchers and stimulate dialogue about the implications of clustering scholarly work in this emerging discipline. To advance data-driven science in this domain, findings offer guidance to integrate social media surveillance insights related to e-cigarettes from diverse platforms.

Session F-1

Exhibit 1

Friday, March 1, 2019, 9:00 am

Location: Montezuma Hall

538 9:00 am WW

The Scenic Design of “Mas”

Adam Parrocha, Theatre Arts - Design and Technology for the Theatre (Scenic Design) (M)

The duty of a scenic designer in the theatre is to interpret what’s written on the page into a fully realized setting. A design can be wildly abstract or a finely detailed interior. However, the

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design should always be in support of the story being told.

The process begins with reading the script, usually several times. From there, the designer begins to form a visual approach to the material, analyzing the script page by page looking for clues on how to tell the story not only through tactile environments, set dressing and props but also through evocative and visceral atmospheres and moods.

In design, “don’t make things up” is a good piece of advice. The designer doesn’t have to invent a new kind of window because there are millions of windows to draw inspiration from. The designer can take a little bit of this and that to create something specific that is, in fact, based on research. Indeed, the research phase of design can be overwhelming because so much imagery can be amassed, but it is ultimately rewarding and inspirational because the designer becomes knowledgeable on many subjects.

One of the best tools used to convey how the stage will look is by using a scale model of the set. The director can use the model to pre-visualize the show by seeing the spatial relationships between performers, demonstrate complex scene changes or examine audience sightlines.

The scenic designer collaborates closely with the costume, lighting and projection designers to ensure the production has a unified and cohesive look. Developing color palettes is an important part of the process. The color of the set should be harmonious with the costume design and not incongruent with the lighting design.

Once the scenery is drafted it is given to the technical director, who is responsible for the construction. Once the build of the show starts, the designer visits the scene shop often to check on the status of fabrication, examine paint samples and to answer any questions the build team has leading up to rehearsals and until the opening of the show.

Session G-1

Performance Arts 1

Friday, March 1, 2019, 1:30 pm

Location: Montezuma Theater

539 1:30 pm

Glow

Kaylee Arca, Journalism (U)

The three poems: Fearfully in Love, Glow, and A Year of Change highlight stories of a woman in an abusive relationship, a child born into hatred, and the imperative nature of collaboration and contribution to a functioning society. Fearfully in Love, details a violent love story between a woman and man. The woman still loves the man even though his abuse caused physical and psychological damage. Glow, is a depiction of a child created in a rare connection of love between two warring sides. The poem wonders what will happen to the child born into hatred. A Year of Change, paints the beauty and diversity of each season. The four season are an analogy to the different types of people. Humans, like the seasons, are all unique but must work together to create a functioning society.

540 1:50 pm

Disappearing Act

Brenda Taulbee, Creative Writing, Poetry (M)

Using a combination of narrative and lyric poetry, this work-in-progress manuscript is an exploration of poverty’s impact on the individual, the family, and communities as a whole. Using the lens of deprivation-- intentional and otherwise-- these deeply personal pieces are a meditation on families (both chosen and origin) and how intergenerational hunger shapes our ability to feel fed. The material also grapples with addiction, disordered eating, domestic and sexual trauma, suicide and how identity is shaped by these experiences. Drawing on the kairos of the Own Voices, Times Up, and #MeToo movements, I want to unflinchingly bear witness to the female experience. Taking a circular approach to chronology, the manuscript mimics the process of healing from trauma. Each section ripples outward, overlapping with and building upon those that precede it to replicate the lived reality of intergenerational poverty. It is my hope that the work strikes a balance between the profound and the profane. I want to write a book of prayers to and about the body and its messy, human resilience.

541 2:10 pm

In-Between Blood

Celeste Morales, Creative Writing (M)

“In-Between Blood” is a creative written work in poetry in which Latinx, and middle spaces play an integral role. The speaker speaks towards being a part of three cultures. In being mixed race as a Puerto Rican and Mexican descendant and the struggles of having two combative cultures in the home. Identifying oneself, while simultaneously also finding herself in a world outside of the family where she has to navigate through being other’d because of the bordering of two cultures. This all in turn, leads to struggles in personal relationships in love and sex, as well as battles with a legacies that is viewed as cursed. In the end she chooses to show how she almost submitted to the idea of this curse when she became a single parent, but also chose to surpass it in finding her own way in the end.

542 2:30 pm

4 EKGs in A Minor: A Piece for Peace for Our Time and for All Time

Andres Wong, BM Professional Studies General (U)

The minimalism movement in the world of art of the 20th century came about from the awareness of, and as a reaction to the excesses in society, excesses that were being reflected in art, particularly music.

The purpose of my imitating EKG sounds was to direct the listener to one’s own heart and contemplate on the simplicity of life, as well as the stark reality that all of us will eventually pass away from this world. It is meant to be reflective and meditative.

This composition has three stages imitating the stages in life. In

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the first, one realizes one's own inadequacies and differences represented by the four EKGs entering at their own time and doing their own rhythms.

Then in the middle, the four become in sync, representing the stage in life when one achieves harmony and conformity with, as well as the understanding of one's role in the surrounding world.

In the end, after establishing some sense of how the world functions and confidence about one's own place in society, each ventures to strive and establish one's unique identity represented by the slow divergence of the four EKG sounds from one another until each one comes to the end of one's earthly journey, each in one's own time, struggling to live life until one's very end.

Played in a loop repeatedly, this musical piece brings alive the circle of life, with new EKGs starting all over again after the end of the current ones.

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543 2:50 pm

Nathaniel the Goldfinch

Sean Coolican, MFA Creative Writing, Fiction (M)

Nathaniel the Goldfinch is a children's story and picture book that I'm currently working on in the MFA Fiction program at San Diego State University, where I am a fourth year student. I initially wrote the text as part of Dr. Hal Jaffe's ENG 784 Creative Nonfiction class and was inspired by a book we read, Days of Destruction Days of Revolt, a New York Times bestseller written by Chris Hedges with illustrations by Joe Sacco. A semester later, I picked up my text and added illustrations as a project for my ENG 503 Changing the Landscape of Contemporary Children's Literature class under the instruction and mentorship of young adult author Matt De La Pena. The narrative is about a goldfinch who befriends a homeless men and female migrant worker in a quest to learn more about the ever-growing problems in the world.

The story can be enjoyed and analyzed by both children and adults. Children will be entertained at how humans and animals interact, while adults will see a more serious statement about societal problems, especially locally in the Southern California region. What's especially interesting is how the human characters' backgrounds are revealed: the homeless man is a former university professor while the migrant worker is an educated biologist.

Before I drafted and created the illustrations, I spent the semester using the San Diego State University Library to check out and study a wide variety of children's picture books and young adult literature. From traditional classics such as The Outsiders and The Chocolate War to diverse contemporary works that use illustrations like The Absolutely True Diary of a Part-Time Indian and American Born Chinese, I read, observed, and analyzed how children's literature is changing and how many are centered on continuing the conversation of social justice.

For the presentation, I plan on giving an engaging reading while displaying the illustrations. This will be my second consecutive SDSU Student Research Symposium; last year I presented a children's story, My Name is Stubbins, which won Award for Outstanding Creative and Performing Art.

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544 3:10 pm

"Atena"

Jenna Castillo, Television, Film, and New Media - Production (U)

In summer 2018, I traveled to Accra, Ghana with Professor Mark Freeman to collaborate with well-known Ghanaian creatives. We produced a location and cultural based experimental short film with local dancers and filmmakers. The goal of our experimental film was to highlight the everyday life of an Accra citizen.

At SDSU I am a production student with an emphasis in cinematography. I am one of the only women in my program to pursue such as specialty. Which comes as no surprise as a recent study completed by Dr. Martha Lauzen of SDSU, reveals that women only make up 4% of industry cinematographers. As a cinematographer for both narrative and documentary productions, this film was a great opportunity to expand my horizons.

In Accra, I learned how to think on my feet, collaborate with people from a different cultural background than my own, and the importance of pursuing stories and art that pushes for inclusivity and diversity.

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545 3:30 pm

Embodied emotions in performance

Zack King, Dance (U)

This research is about the transferability of performance skills from one artistic discipline to another. Through the practice of shifting between emotional states while dancing, I research how emotions manifested through my physicality and vocal expressions. Feeling reimagines relationships between music and dance via a cast of six professional artists, who fully are willing to engage their artistry beyond their respective disciplines. The project is inspired by Jaak Panksepp's The Archeology of Mind: Neuroevolutionary Origins of Human Emotions. In it, he articulates the 7 basic emotional systems that underlie all other emotions. These are: seeking, fear, rage, lust, care, grief, and play. In a solo called "Okay", professors Jess Humphrey (SDSU) and Eric Geiger (UCSD) direct me to say the same word in repetition from the largest possible range of emotional states. Sometimes it is a whiplash from one emotion to another and sometimes the change is gradual. Another section of Feeling studies performers whose wielding of emotions was so powerful that although their performances were on video, we could feel our bodies' physiological effect in response. We study these fully embodied expressions as they manifested in camp films (Mommie Dearest) and divas (Whitney Houston and Diana Ross); and we felt it in our own bodies in response to soul music and power ballads played during rehearsals. We amass a collection of sources to draw from during the practice and performance of a group section we came to call "SAD DC". An essential element of this section was to continually cycle through and/or switch between the

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different sources while feeling each one as fully as possible, sometimes to the point of exaggeration. In my presentation, I will 1) show two of the sources we used for the "SAD DC" section and one clip of the cast performing that section 2) perform a short solo from the piece called the okay score 3) articulate my experience of switching between sources, how it honed my ability to recognize different emotional states while transforming, and how those skills are transfered to my work as an actor.

Session H-1

Oral Interdisciplinary 13
Saturday, March 2, 2019, 9:00 am
Location: Pride Suite

546 9:00 am

The Impact of Probiotics on Cortisol Metabolism

Nina Ly, Chemistry with an emphasis in biochemistry (U)

Physical and Mathematical Sciences 9.

547 9:15 am

Identification of the epitope on CD4 that is recognized by the anti-HIV Q425 metalloantibody

Sally Luong, Biochemistry (U)

According to the Center for Disease Control and Prevention, there were 1.8 million new cases of Human Immunodeficiency Virus (HIV) in 2017. About 36.9 million people are living with HIV around the world in 2017, and 21.7 million are being treated for HIV. HIV uses CD4, a protein on a helper T-cell, to bypass and infect the T-cell, where it further replicates itself. Q425 is an anti-CD4 antibody that binds to the third Ig-like domain of CD4. Q425 has sequence homology to LT1009, which is an anti-shingospine-1-phosphate antibody. LT1009 binds to its antigen, shingosphine-1-phosphate, through a unique recognition chemistry involving two calcium ions that contact the phosphate of the small molecule lipid antigen. Due to the similarity in sequence of LT1009 and Q425, we hypothesize that Q425 might use calcium to bind to the extracellular portion of CD4 through a heretofore unidentified phosphate group. In order to test this, the DNA sequence of Q425 was inserted into a pFastBacDual plasmid and recombinant baculoviruses were generated that encode for Q425 Fab fragment expression and secretion from Sf9 insects cells. We have purified the antibody Fab fragments and are currently in the process of identifying its epitope on CD4. In addition to identifying a target for interfering with HIV infection of CD4+ T cells, this work will expand our understanding of the antigen binding capabilities of a novel class of naturally occurring metalloantibodies.

548 9:30 am

Cracking the Gut/Brain Axis with MAD Mice

Candice Lambert, Analytical Chemistry (M)

Hypothesis: Alcohol consumption affects the intestinal microbiome producing a metabolic response in the brain.

Statement of Methods: Whole mouse intestines were acquired through Daryl Davies' lab at the USC School of Pharmacy. These mice possess Alcoholic Use Disorder and the test groups were treated to study how antibiotic exposure in the gut-microbiome effects addictive behavior. Through tissue metabolite extraction and liquid chromatography coupled with high resolution mass spectrometry, the metabolic signaling changes between the control and test groups are revealed. The mouse intestines were flash frozen after post mortem surgical removal and sliced into 40-100 microgram samples. These samples were then treated with a 2:2:1 solution of acetonitrile, methanol, and water respectively, to extract metabolites from the samples. After protein precipitation and separation, the samples are dried with nitrogen gas, followed by a BCA assay for quantifying protein content. Samples are reconstituted with 1:1 acetonitrile and water, then subjected to untargeted metabolomics analysis. The results of this analysis were evaluated using XCMS Online bioinformatics platform and subsequent metabolites identified using the METLIN, BioCyc and KEGG databases. This process has been optimized as proof of concept for a later experiment involving an in vitro intestinal gut reactor system.

Essential Results or Outcomes: Preliminary analysis of these data have shown significant dysregulation ($P < 0.01$, fold change > 1.5) of 15 possible metabolic pathways in the antibiotic treated group. Two of the most interesting metabolites are sphingosine-1-phosphate, which is involved in cellular process regulation, and Ubiquinol-6, involved in mitochondrial electron transport. Validation of the results will be done via tandem mass spectrometry to confirm and quantify these metabolites.

Conclusion or Summary: This process for tissue analysis is optimal for detecting metabolic differences in treated and untreated test subjects. The results lead to the identification of possibly 15 dysregulated pathways involved with alcohol consumption caused by microbiota. The information gained from this study can be used as supporting material for the USC's School of Pharmacy Davies study on the changes in behavior caused by alcohol consumption, as well as supporting material for the development of an in vitro intestinal model.

549 9:45 am

Oral Contraceptives on the Gut Brain Axis

Myedith Damba, Chemistry (M)

Metabolomic studies have recently increased in popularity due to new and improved technology to analyze large data sets that link the metabolites found in biological systems to metabolic pathways, which can give insight into upstream protein function or gene expression changes. There is an inherent link between our gut bacteria and brain function

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known as the gut brain axis. Gut bacteria are known to produce neurotransmitters and hormone-like metabolites. Different bacterial species contain different metabolic pathways, much of which are uncharacterized and may be connected to development and/or progression of neurological disorders. Changes in bacterial metabolism are of particular interest when exposed to pharmaceuticals. Oral contraceptive pills containing the active ingredients levonorgestrel and ethinyl estradiol are taken by many women to prevent unwanted pregnancies and can have other advantages including treating hormonal induced acne, reducing the frequency and intensity of cramps, and controlling heavy menstruation flow. Although the pill has many benefits, it can also have adverse effects like lability, depression, and mood swings. To date, preliminary data has been generated from my current studies that illustrate putative metabolites produced by Bacteroides fragilis perturbed with levonorgestrel at a concentration used in Plan B. The impact of oral contraceptives on the gut microbiome is relatively understudied, but has known connections with inflammatory bowel disease. This relationship introduces the question, "What other consequences do oral contraceptives have on the gut microbiome and is there an effect on the gut brain axis?" This bidirectional link between the central nervous system and the enteric nervous system can potentially identify missing links between oral contraceptives and mood disorders. It is still unknown why some women are susceptible to these conditions while others are not. My hypothesis is that gut microbial composition plays a role in regulating mood and behavior and can be altered when subjected to synthetic hormones.

550 10:15 am

Discovering Novel Phages in the Human Gut

Melissa Giluso, Bioinformatics Medical Informatics (M)

Viruses are the most abundant biological entities on the planet, but the high levels of variability between viral sequences and lack of known hosts has left a large majority of these sequences unable to be documented using traditional laboratory techniques.1 Through the use of viral metagenomics, it is possible for these sequences to be identified computationally. One such example is crAssphage, a highly abundant bacteriophage present in a majority of human guts that was only found computationally and received its name after the cross assembly tool, crAss, used to discover it in 2014. We now have over 4,000 human fecal metagenomes available to be compared in order to explore the viral "dark matter." We have created a computational pipeline that takes in Next Generation Sequencing (NGS) reads from metagenomes, assembles the reads into contigs, uses the same cross assembly approach to find abundant, co-occurring contigs, and sorts these contigs into assembled genome bins that can hopefully be identified as novel phage genomes with further analysis.

551 10:30 am

The role of kinase activity in the biosynthesis of threonylcarbamoyl adenosine in bacteria

Naduni Paranagama, Biochemistry (D)

tRNA, the central molecule of translation, is heavily modified post transcriptionally with noncanonical nucleosides that constitute ~83% of all RNA modifications. These modifications cluster in the anticodon stem loop (ASL) and core regions (D- and T-loops) of tRNA, and they are necessary for translational fidelity and diversification of codons. The ASL modification N6-threonylcarbamoyl adenosine (t6A) found at position 37 in ANN-decoding tRNAs (N is any nucleobase) is universally conserved in all kingdoms of life. Due to its essentiality in bacteria, the t6A biosynthesis pathway has recently emerged as a potential antibacterial target. Bacterial t6A biosynthesis begins with synthesis of the intermediate threonylcarbamoyl adenylate (TC-AMP) from threonine, ATP and bicarbonate by the TsaC enzyme, followed by transfer of the threonylcarbamoyl moiety from TC-AMP to A37of substrate tRNA by the theonylcarbamoyl transfer (TCT) complex, comprised of the three proteins TsaB, TsaD and TsaE. We recently showed in T. maritimathat while the TsaBD complex is the substrate binding platform responsible for TC transfer, the complex becomes inactivated after each t6A synthesis cycle, and a TsaE-dependent ATP hydrolysis step "resets" the platform for multi-turnover catalysis. This led us to propose that ATP hydrolysis affects a chemical change such as phosphorylation that occurs in the TCT complex after TC transfer. To test this hypothesis, we investigated the kinase activity of TsaE using a combination of radiochemical assays, X-ray crystallographic and mutagenesis experiments. The results show that in the free form, TsaE acts as a tyrosine kinase that autophosphorylates at the invariant surface residue Tyr82. When bound in the TCT complex kinase activity is abolished, due to sequestration of Tyr82 in a tight pocket in TsaD, and switched to ATPase activity. Further, all active site mutations that abolished ATPase activity also abolished kinase activity, but not vice versa, indicating that the two activities are independent of each other. T.m.TsaE does not possess transphosphorylation activity. Further investigation of this hypothesis is underway.

Session H-2

Oral Interdisciplinary 14
Saturday, March 2, 2019, 9:00 am
Location: Park Boulevard

552 9:00 am

Decolonizing the inner self: Gloria Anzaldua's Borderlands the New Mestiza

Martha Mondragon, History (U)

Never in my 31 years had I felt so validated. Analyzing Gloria Anzaldua's Borderlands the New Mestizathrough a post-colonial perspective not only revealed the ways that her life was shaped by the unfortunate effects that colonialism

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left behind to those who were of mixed breed; it also helped me to understand my own struggles with the gender relations in my family, the Catholic Church, and community, all stained by coloniality. Juxtaposing Anzaldua's writing and life with my own experiences as a first generation Mexican-American living in San Diego, my post-structural approach explores issues of colorism, classism, racism, patriarchy, domestic violence, religion, culture and food. I hope that this analysis of Anzaldua's and my own struggles to achieve a sense of self-worth, self-acceptance and identity, will empower others to decolonize the inner self.

In my research, I chose to take a humanistic approach in my examples to help decipher why I felt the way that I did for such a long period of time. I use first hand experiences to demonstrate how Gloria Anzaldua's book is still relevant to this day. Her lines, "kin become enemies" resonate so much with the current political administration in its push to metaphysically and physically divide soil, families and people. Borders that bleed, that not only affect mother earth, but those who have to live in the middle, in border towns where it is so easy to be around what can make you comfortably uncomfortable. Those who are anywhere in the middle experience pain. Anzaldua's powerful post-colonial, feminist theories can assist the oppressed, mostly people of color, to decolonize the inner self. Time and places can change, but some things like pain can linger and have devastating consequences if not healed.

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553 9:15 am

The Filipino-American Struggle: Descendants of the Colonized & Post-Colonial Identity Crisis

Rustico Rasing, History (U)

The identity of descendants of colonized societies is a product of the culture imposed by the colonizer, and the struggle to escape from that culture. My research applies intertextual and post-colonial analysis to three works of Filipino literature from the peak of colonialism to the present day, to explore the identity crisis of Filipino descendants of the colonized.

Jose Rizal's novel, Noli Me Tangere, is of immeasurable importance to the development of Filipino identity. Written during the peak of Spanish colonialism in the Philippines, Rizal's novel introduces issues and themes central to the effects of colonialism on Filipino and Filipino-American identity; these issues and themes resonate throughout different time periods of the post-colonial era. America is in the Heart by Carlos Bulosan provides an insightful male perspective of the struggles to find oneself during the early years of post-colonialism. The effects of colonialism are also apparent in more recent contemporary writings such as America is Not in the Heart by Elaine Castillo. Intertextual analysis of these two works reveals some similar issues in the continued struggle to validate Filipino self-identification, reverberating down from Rizal's novel to the present, but also the different outlook of a modern day female account. Together, these works reveal that the struggle to define a Filipino identity in the post-colonial era is directly a product of the Spanish colonial rule and the American imperialist occupation, and that one can best understand these post-colonial intellectuals through the colonized ancestry that shaped their perspectives.

554 9:30 am

A hero in the shadow

Laure Gerard, History (U)

The United Nations Organization was founded in 1945, and sent its Peacekeepers throughout the world in dangerous, conflict-ridden areas to reinstate and keep the peace. Yet historical narratives of the many wars and conflicts of the late 20th century never feature the United Nation Peacekeepers and their contribution to history. The deeds of the peacekeepers are often forgotten. The purpose of my research is to shed light on the heroes in the shadows: the people who sacrificed so much in the name of peace.

Robert Gerard, born in 1924 in Scalyn, Belgium, dedicated his life to maintaining peace in the world. He is also my grandfather. Through textual analysis of his unpublished papers (housed in Belgium) and his oral accounts of his past, I was able to learn about his story. Gerard began his career during WWII, when he was obligated at the age of sixteen to join the Allied army. He quickly climbed through the ranks and was promoted to serving the Allied army as pilot and spy.

After the war, Gerard offered his service to the UN peacekeeping unit in 1954 in Palestine in the city of Gaza and Damas for two years. During the devastation caused by the conflict between Palestinian Jews and Arabs over the city of Gaza, Gerard patrolled the border and investigated human rights violations. During a mission meant to liberate Jewish prisoners, Gerard was gravely wounded by a mortar weapon. His heroism was acknowledged and he received a United Nations peacekeeping medal. He continued to serve the United Nations for years to come in Congo, Zaire, Saudi Arabia, Cameroun, Mali and Nigeria as a director. He was awarded a Nobel Peace Prize in 1988, but did not receive it until 2013. Gerard holds Belgium's 12th Nobel Prize and is viewed as a remarkable individual in his small country, but he and the other United Nations Peacekeepers are unknown in other areas of the world. I hope my research will honor their quiet, significant contributions to world peace in the 20th century.

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555 9:45 am

Jewish Immigrant Children in 20th-century America: Dangling between Two Worlds

Sara Fakhoury, History (U)

The unprecedented influx of Jewish immigrants to America in the early 20th century introduced cultural tensions that impacted both young and old. Jewish immigrants faced segregation in ghettoes in American cities, and anti-immigrant, racist stereotypes created by "nativist" Americans that walled them in and limited the immigrants' opportunities. Historians have reconstructed the immigrants' experiences primarily from the perspective of adults; yet the majority of Jewish immigrants were children. Like other children, Jewish immigrant children have been neglected in the American historical narrative due to a limited number of written primary documents (historians' traditional sources) as well as a persistent refusal to acknowledge their central historical roles.

Applying textual, visual, and psychological analysis to

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manuscript materials in the SDSU Library's Special Collections and to published memoirs and autobiographies, my research attempts to recover the experiences of Jewish immigrant children in 20th-century America. Like their parents, these children faced discrimination and limited opportunities, but they also were tempted by American popular and consumer culture. Far more than their parents, these children dangled between two worlds: the segregated Jewish community in which they lived and worked, and the wider American society to which many sought to assimilate.

Two rich manuscript collections in Special Collections reveal how similar conditions could lead to very different results in children's lives. Ida Nasatir described how the Jewish religion affected her childhood positively because of its structure and community, although she experienced discrimination because of it. Conversely, Travis M. Kornfeld's letters to his mother about his childhood stressed his desire for assimilation, to blend into American society; he "Americanized" his name to Murray as a Stanford student. Finally, Anzia Yezierska's fictionalized autobiography, Bread Givers, traced a young girl's rebellion against strict family and religious traditions to pursue an education, only to return to Hester Street to care for her father and to teach other immigrant children "proper" English. Family, community and religion affected Jewish children psychologically in different ways. The desire for assimilation and to de-center religion overpowered many, but others continued to find strength in Jewish traditions.

556 10:00 am

Beyond the Words of Genocide: Memory, Trauma and the Rwandan Genocide

Joshua Melendez, History (M)

The fluidity and malleability of memory have made it a suspect source, contested in its viability to extract knowledge. Oral history stands as a representative of memory and an important tool in conducting research beyond the level of the elite. Historians of certain events, such as the Rwandan Genocide, rely heavily on oral history as a window into what happened on the ground in lieu of other sources. It creates narratives that would otherwise receive no voice, no acknowledgment through traditional sources. This recovery dynamic of oral history is the most established method of using these unique sources; however, this is not the only use of oral history. The very subjectivity of the sources grants a perhaps more intriguing lens into the society and experiences in which the memories were produced. The violent and tragic nature of the event in which these particular memories were constructed brings an unavoidable traumatic element to members on both sides of the conflict. In understanding the creation of narratives, acknowledging and considering the presence of that trauma within the memories behind these testimonies cannot be ignored.

My research focuses in on this aspect of oral histories produced in the aftermath of the Rwandan tragedy. Through the visual, textual and psychoanalytical analysis of several survivor testimonies, I examine the manner in which trauma influences the creation and presentation of oral history. Looking not only at what is being said by the survivors but also paying particular attention to what is not said or what is expressed nonverbally, these testimonies offer insight into the larger cultural phenomenon of coping strategies. From the USC Shoah Foundation Visual History Archive, I have closely examined a range of Tutsi survivor testimony varying in age and gender collected generally 10-15 years post-genocide. This inquiry intends to expand the manner in which oral histories as a source are used, to look beyond the words not only to cultural implications but to the manner in which the genocide lives on in the bodies and minds of its survivors.

Session H-3

Oral Humanities, History, Literature, Philosophy 3
Saturday, March 2, 2019, 9:00 am
Location: Tehuanco

557 9:00 am

The Black Freedom Struggle and the Cold War

Cassandra Tanks, History (U)

Black Freedom fighters and civil rights leaders in the United States looked abroad during the Cold War era for support, community, and means to effect change for African Americans living under the yoke of institutionalized racism and discrimination. By turning to Cuba, China, North Korea, and Algeria, leaders such as Robert F. Williams, Eldridge Cleaver, and Kathleen Cleaver brought a domestic movement to the international stage during a transformative era.

Evaluating the civil rights struggle from a transnational perspective affords a broader understanding of both the international implications of the Black Freedom struggle and its place in the tangled web of Cold War politics. The civil rights and Black Freedom movements were important threads in the vast Cold War tapestry. The goal of this project is to place context around civil rights leaders operating abroad, whether due to exile or seeking support, in light of the ongoing Cold War and sharpening foreign policies of the United States to better understand the transnational effects of their work.

The scholarly works of Sean L. Malloy, Mary L. Dudziak, and Judy Tzu-Chun Wu and the written works of Williams, Cleaver, and others inform the analysis of civil rights during the Cold War. Additionally, documents from United States government archives provide the contextual analysis of foreign policy while Black Freedom leaders operated abroad.

This research highlights how the Cold War magnified tensions, fears, and assumptions among civil rights leaders abroad and policy makers within the United States government. The transnational aspect of the civil rights movement intensified anxieties within the United States regarding the Cold War and, ultimately, brought more attention to the racial injustices and inequalities African Americans had, and continued to, endure in the United States.

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558 9:15 am

Winning the Battle But Losing the War: The Tet Offensive Through the Eyes of the Johnson Administration

Jeremy Mazur, History (U)

Over the course of a war that had many shocking and memorable events which played out in the media, one of the most significant events was the Tet Offensive. While many people have their own interpretation as to what the offensive meant regarding American effort and progress in the region, it is undeniable that it sealed President Lyndon Johnson's fate for his chances of reelection in 1968. This thesis will examine the words of Johnson and members of his administration in an effort to understand the rationale for their action or inaction during this crucial period for American involvement in the Vietnam War. Through a study of their memos, meeting notes, memoirs, and public and private statements, the administration's perspectives are compared to contemporaneous media reports that support or contradict the messages found in the aforementioned sources. This thesis argues that Johnson and his administration had the intention of working with the press to keep them informed of the situation in Vietnam as they saw it. However, it was a failure to comprehend the situation as outsiders saw it, as well as a preoccupation with anticipating a worse attack to come, that helped create an irreparable credibility gap that Johnson paid for with the forfeiture of candidacy in 1968's presidential election.

559 9:30 am

United States Keeps It Cool - Dave Brubeck Quartet's State Department Tour of 1958 and the Concert Series in Bombay, India

Michael Campbell, History (M)

During the 1950s, the United States Department of State began using jazz performers as part of their diplomatic exchange program. This decade saw both United States and Soviet Union using culture to enhance their international prestige. Classical music and ballet were among the more popular art forms used by both nations, but it became clear to President Eisenhower that these exhibits were Eurocentric, and did not fully show the individualism and freedom that the State Department hoped to present. Jazz was perfect because it was American made and it fulfilled the image of American freedom that the State Department wished to portray. The use of improvisation perfectly encapsulated freedom, and countered the stringent rules of classical music. In 1958, the State Department sent the Dave Brubeck Quartet (DBQ) on a tour through the nations which bordered the Soviet Union. The music of DBQ was jazz, but incorporated classical music as well.

Using the Dave Brubeck Quartet for the 1958 State Department tour was intentional because they were appealing to an audience more interested in classical music. Some audience members would associate the music and lifestyle of jazz to that of infamous rock 'n 'roll. "Jazz Diplomacy," as this cultural exchange would become known, has been a popular topic among scholars of Cold War, race, and diplomatic history. Methods of urban history and musicology have been left out of this conversation, and are crucial to understanding the reasons and goals of jazz diplomacy. Academics such as Lisa Davenport and Nicolas Cull have provided substantial secondary sources for studying jazz used for diplomacy. These secondary sources will be accompanied by primary source material from the Brubeck Collection located at the University of the Pacific in Stockton, CA (visited in spring 2018). By focusing on the music of the Dave Brubeck Quartet and on one urban center, in this case Bombay, India, it will provide a fuller understanding of jazz diplomacy. The Brubeck Collection has provided many sources that relate to the four-day concert series in Bombay, India in April of 1958.

560 9:45 am

Play Only in the Sandbox: How the Johnson Administration Avoided a Sino-American War in Vietnam

Eugene Phillips, History (M)

The United States considered the People's Republic of China to be a major threat to its regional interests in Indochina during the American war in Vietnam. Johnson Administration officials in the State and Defense Departments carefully considered how the PRC could potentially react towards American escalation in Vietnam in the formative years of 1963 to 1965 before sustained bombardment of North Vietnam and the first marine deployment to South Vietnam. Despite research into Sino-American relations throughout the 1960s and 1970s, the determination of administration officials to avert a war with the PRC while increasing its support for South Vietnam has scarcely been analyzed. Declassified documents from the State and Defense Departments, along with released intelligence reports, demonstrated the concerns and debates about potential Chinese intervention in Vietnam which took place within the administration. American foreign policy objectives towards the PRC were based around containing the latter's presence in Southeast Asia and minimizing its support for North Vietnam. This was accomplished by determining the nature of the PRC's support to the DRVN and incorporating what was known of the Chinese-North Vietnamese alliance into the administration's plans for escalating the American military presence in Southeast Asia to forestall aggressive Chinese reaction that could lead to a war.

561 10:00 am

The Hue Massacre of 1968

Cody Billock, History (M)

During the Vietnam War, the People's Army of Vietnam and the National Liberation Front launched a surprise offensive on the new year's holiday of Tet. January 30, 1968, marked the start of the largest operation of the war to date and came directly on orders from Hanoi and the General Secretary of the Party, Le Duan. The most successful portion of the General Offensive-General Uprising campaign came in the occupation

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of the ancient capital city of Hue which lasted for 28 days. During this period, revolutionary forces eliminated somewhere between 2,800 and 5,000 residents of the city. The deceased were mostly made up of officials from the South Vietnamese government, former supporters of the French colonialist regime and members of the Can Lao party who had orchestrated the brutal 'Denounce the Communist Campaign' in the 1950s. In addition, there was also U.S. personnel, aid workers from Germany, a Taiwanese official and even children found in the dozens of mass graves. Most of the bodies discovered had their hands tied behind their back indicating that they were buried alive or were found with a bullet wound in the skull. Authorities in Hanoi and some scholars have argued that the dead were the result of U.S. Air bombings in the fight to recapture the city, or that in a panicked retreat the revolutionary forces killed the prisoners in an act of self-preservation because they feared being identified by the South Vietnamese government. While it is possible that these theories could explain for some of the dead, the evidence suggests that this was an orchestrated political cleansing. Through the examination of captured documents, oral interviews with survivors and archival research, it becomes clear that communist forces systemically purged Hue of their political opponents.

562 10:15 am

The Assault Youths and Vietnamese Cultural Militarism 1950-1975

Thanh Nguyen, Department of History (M)

During the Vietnam War, there existed a paramilitary organization made up of individuals whose age ranged between sixteen to twenty-six years old. They acted as support units to the communist main forces, the North Vietnamese Army and Vietcong guerillas. This was the Assault Youths, a group of youth adults and teenage soldiers from all sexes, religious, and social economic background. In the North, the Assault Youths supported logistic, road construction, and de-mining. In South Vietnam, they also took the role of infiltration, propaganda, and recruitment agents. In both regions, the Assault Youths doubled as the training crucible for young recruits, where they were regularly indoctrinated and given technical trainings on the go. Those who graduated were recommended to the main force according to their specialty. Some were not so lucky, however, and casualty was as high as it was unrecognized.

Yet the Assault Youths was more than a support unit. The nature of their age range reflected a much larger political effort, one which was both deliberate in agenda and far-reaching in influence. The Youths existed as the militarized arm of a larger cultural and political movement, known as Youth Organization. This movement, instigated by the Vietnamese Workers' Party in 1950, was aimed at a generation of young, eager, and politically motivated individuals. It intended to create a young population with militant attitude and fanatical devotion. By 1965, the program had developed a distinctive subculture, with traditions and values built on Ho Chi Minh's cult of personality. The Assault Youths that was encountered by American intelligence in 1967 was thus the final product of a larger, elaborated, and prevalent political process. Drawing from official party documents, this study offers an analysis of that process, its origin and impact. It demonstrates deliberate and explicit Party decisions, in 1950, to consolidate political and ideological conformity through the recruitment of young members. It indicates the importance of youth proselytizing in Vietcong recruitment activities. The communist insurgency drew their power not from superior weaponry or wealth, but from human resource. From young, energetic and enthusiastic individuals, that resource was plentiful indeed.

Session H-4

Oral Physical and Mathematical Sciences 13
Saturday, March 2, 2019, 9:00 am
Location: Aztlan

563 9:00 am

Heteroatom Pendant Bases for Ruthenium Catalyzed Water Oxidation

Brett Vincenzini, Chemistry (U)

The transformation of simple starting materials to value added products is the great achievement of chemical catalysis. A catalyst is a substance that accelerates the rate of a chemical reaction while remaining itself unchanged. Catalysts can increase the rates of chemical reactions very dramatically. In one example from our laboratory, a reaction called alkyne hydration was sped up by a factor of 1011 in the presence of the catalyst!

Catalysis offers great promise in addressing the increasing demands for renewable energy sources. Our society's dependence on fossil fuels as a primary energy source is unsustainable and thus untenable. Though fossil fuels are a cost-efficient energy source due to economies of scale, they are also primary contributors to air pollution, climate change, and acid rain. One promising clean alternative is hydrogen gas. Hydrogen can be consumed in a device called a fuel cell to generate electrical energy; the process yields harmless biproducts. An attractive and abundant source of hydrogen is water, which can be "split" into hydrogen and oxygen gas. In this process, the two reactions must occur in tandem. As the catalytic reaction to form oxygen is a more challenging piece of the puzzle it is the principal object of our study.

Our catalysts contain a metal atom and organic scaffolds called ligands. Both metal and ligand work together to move the catalytic cycle. In this study, we undertook modification of a part of the ligand that binds to the metal called an anionic pendant base. This part of the ligand serves several functions, including stabilizing the metal, and attracting and binding incoming water molecules. Pendant bases containing non-carbon atoms are lacking in the water oxidation literature. We are thus appending the ligands with non-carbon containing groups to explore their effects on catalyst speed and durability.

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564 9:15 am

Novel Enantiopure N-Heterocyclic Carbene Half-Sandwich Ir(III) Iradacycle Complexes

Harrison Pearce, Chemical Physics (U)

Piano stool Half-sandwich compounds with different ligands are common examples of organometallic compounds with chirality at their metal center. CP*Ir piano stool complexes were found to be labile, and more recently NHC carbene ligands were found to increase the stability of the metal center, inspiring our design and analysis of a new half sandwich Cp*Ir complex with the NHC carbene directly fused to a napthalimidine to increase structural rigidity. This study involves both computation and synthesis. I focused on the computation. Density functional theory calculations (m06 or pc-2 with cc-pVDZ)with implicit solvation and a variety of basis sets for the purpose of assessing the relative stabilities of two of our proposed Cp*Ir complexes. The relative free energies of both varieties of Cp*Ir complex studied were found to be with 0.1 kcal/mol under the different methods, basis sets, and solvation models. On the experimental end, the compounds were synthesized and then identified with 2D NMR, X-ray crystallography, and circular dichroism spectra.

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565 9:30 am

Control of Bond Strength in H-Bond Dimers via Proton transfer Induced by Electron Transfer

Hyejeong Choi, Chemistry (M)

The underlying principle is straightforward: an oxidation that decreases the negative charge on a H-acceptor (A) or a reduction that decreases the positive charge on a H-donor (D) will weaken a H-bond. Alternatively, reduction that increases the negative charge on a H-acceptor or oxidation that increases the positive charge on a H-donor will increase the strength of a H-bond. However, in the latter case, it is possible that oxidation or reduction could also lead to full proton transfer. If this occurs across the H-bond, the primary H-bonds will remain, but the secondary H-bonds will change. This can lead to an increase in unfavorable secondary interactions, which would counteract the effect of the initial proton transfer. With a proper design, proton transfer could lead to an increase in favorable secondary interactions, which would enhance the effect of initial transfer. The goal of this project is to do the latter.

For this work, the host compound 3 H-bond DAD array, that contains a N-methyl-4,4'-bipyridinium or "monoquat" redox couple has been synthesized. Host forms a three H-bond dimer with the non-electroactive ADA array in CH2Cl2. Typically, DAD-ADA arrays such as this have relatively weak association constants of ~102 M–1 in non-competitive solvents such as CH2Cl2 due to the three, favorable primary H-bonds being counterbalanced by four unfavorable secondary interactions. We believe the most likely explanation of such strong H-bonding in a 3 H-bond array is that the second reduction induces proton transfer across the central H-bond in the complex, thus converting the DAD-ADA array to a DDD-AAA array. The latter is expected to have significantly stronger H-bonding because all of the secondary interactions, in addition to the primary interactions, are favorable. If confirmed by further studies, the association constant in the reduced form would represent, to the best of our knowledge, the largest achieved to date in a redox-dependent H-bonding system, thereby demonstrating the utility of incorporating proton transfer to amplify the effect of electron transfer in these systems.

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566 9:45 am

Electron Poor Phosphines and their Metal Complexes

Daniel Sattler, Chemistry (D)

Bifunctional ligands that contain a pendant base have been shown to accelerate certain reactions. For example, an alkene isomerization catalyst containing a pendant base is over 3000 times faster than an analogue without a pendant base. Electron poor ligands may feature aryl groups with electron withdrawing groups, or fluorinated alkyl groups directly attached to phosphorus. Electron poor ligands have been shown to be capable of changing the course of catalytic cycles. Surprisingly, there are no examples of an electron poor ligand that also have a pendant base. We plan to investigate the effect an electron poor ligand with a pendant base would have in catalysis. To this end, we have synthesized several electron poor bifunctional ligands, along with their metal complexes. Investigations into the catalytic activity of the complexes has begun.

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567 10:00 am

Studies on the Design, Synthesis, and Reactivity of Phosphine Ligands Containing Protic Imidazolyl Groups

Braden Silva, Chemistry (D)

The ability to construct new molecules for pharmaceuticals, agrochemicals, and functional materials has become increasingly efficient and direct in large part because of the continued development of new reaction pathways made possible by transition metal catalysts. Increasingly, research in the field of catalysis has shown that the steric and electronic environment of the ancillary ligand supporting the metal center can enhance the rate of otherwise slow fundamental reaction steps. Furthermore, new research has focused on extending the ligand influence to the secondary coordination environment. The focus of this presentation will cover the design, synthesis, and reactivity of new phosphine ligands that include adaptable hydrogen bond donors and acceptors. The major hypothesis driving this work is that the ability to switch between different hydrogen bond networks within a transition metal complex will allow for the stabilization of reactive molecules and high energy transition states. For example, computational studies indicate hydrogen bond donors can stabilize an unstable hydroxide ligand coordinated to a platinum bis-phosphine complex by more than 10 kcal/mol. By linking together the reactivity of new metal complexes with abundant chemical feedstocks, we hope to design sustainable

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chemical reactions that are useful to industrial chemical synthesis as well as new academic research. The research presented in this report will draw from both experimental and computational results. The experimental studies rely heavily on the use of nuclear magnetic resonance (NMR) spectroscopy; and the computational studies are conducted with the use of density functional theory.

568 10:15 am

C-metallated Ligands for Water Oxidation Catalysis

Aaron Nash, Chemistry (D)

Energy conversion and storage presents perhaps the greatest challenge to supporting human population in the coming decades. Continued reliance on fossil fuels is ultimately unsustainable as the cost of obtaining and refining these limited resources becomes more difficult and expensive. To that end, the scientific community has turned its attention toward clean and renewable sources of energy. The widespread adoption of such clean energy sources has a major scientific obstacle to overcome – the storage of energy as fuel for later use.

An ideal renewable fuel process would entail storage of solar power in chemical bonds. Such a "solar fuel" would yield innocuous byproducts upon consumption and could be renewably produced in a cyclic fashion. Hydrogen gas is an attractive candidate in this regard, as it has an energy density nearly three times higher than that of gasoline. The oxidation of water presents an enticing alternative to fossil fuel dependent H2 production. Water is readily available, and the only byproduct of its oxidation is oxygen gas.

There are two reactions that constitute the net water oxidation reaction: the oxygen-oxygen bond formation reaction, and proton reduction to hydrogen gas. The oxygen-oxygen bond formation reaction is the more demanding of the two and is presently is our current area of study. Our lab develops catalysts for this challenging reaction, wherein we focus on modification of catalyst architecture to improve speed and longevity. There are two domains of catalyst modification that can be pursued: the metal where the chemical transformation takes place, or the ligand that stabilize the metal. Our approach focuses on the ligand, wherein we modify the ligand metal binding sites. In this study, we focused on incorporating more strongly-donating carbon-based donor sites in place of the typical nitrogen donor. The goal of the modification is to stabilize proposed catalytic intermediate and promote rapid formation of dioxygen. The synthesis, characterization, and catalytic performance these compounds will be discussed with specific reference to the effect of carbon/nitrogen substitution.

Session H-5

Oral Behavior and Social Sciences 20
Saturday, March 2, 2019, 9:00 am
Location: Metztli

569 9:00 am

Accounting for the Sampling Variability of the Mean and Standard Deviation when Conducting Simple Slopes Analysis

Emma Grossman, Statistics (U)

Many psychological theories prescribe moderation, or that the relation between a dependent and independent variable changes according to a moderating variable. Researchers typically test for moderation using an interaction term in regression analysis, and decompose the interaction by calculating simple slopes. Typically, researchers to calculate simple slopes at one sample standard deviation above and below the moderator's sample mean, and then use the simple slopes (along with their p-values, confidence intervals, and effect sizes) to gauge the degree to which sample data support a theory. However, that practice does not account for the sampling variability of the sample mean and standard deviation (i.e., that practice assumes that the standard error of the sample mean and standard deviation equals 0), which leads to an underestimate of the p-value for the simple slope (i.e., an increase Type-1 error rate). This talk describes and compares an alternative method for estimating simple slopes that accounts for the sampling variability of the sample mean and sample standard deviation. The results will be demonstrated through empirical example to show how researchers may account for this source of sampling variability.

570 9:15 am

"The Box": Effects of San Diego Hepatitis A Outbreak on Transitional Aged Youth Using Photo Voice and Community Based Participatory Research

Talia Kieu, Public Health (U)

Introduction: In September 2017, San Diego County declared a local health emergency in response to a Hepatitis A (HepA) outbreak, a crisis that was largely attributed to the growing homeless population. Efforts put forth by the county to mitigate the outbreak focused on controlling modes of disease transmission, including pop-up vaccination clinics, street sanitation, and construction of tent cities. Many of these interventions, however, were implemented without input from those experiencing homelessness, including a particularly vulnerable population, 18 to 24-year-olds experiencing homelessness, or "transitional age youth" (TAY).

Methods: The present study aimed to examine how the HepA outbreak and associated interventions impacted the health and well-being of TAY experiencing homelessness. Individual interviews with key stakeholders (e.g., social service providers) and participatory methods, including photo elicitation and

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critical discussion ("photovoice"), gathered narratives from 10 TAY currently or formerly experiencing homelessness using the SHOWeD method. These multiple data sources were integrated and analyzed to identify key themes.

Results: Preliminary results suggest that the HepA health interventions executed by San Diego County, as well as other resources offered to those experiencing homelessness, may perpetuate stigma and negatively influence physical and social health in the homeless community.

Conclusions: Hepatitis A is the symptom of a much larger, structural problem. Closer examination of HepA Interventions from the perspective of TAY reveal a social quarantine that limits lateral or upward mobility, which youth partners have named "the box". These findings have implications for policymakers, those distributing resources to TAY experiencing homelessness, and public health agencies.

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571 9:30 am

Exploring Effective Study Recruitment Strategies for Mexican-origin Young Adults

Felicia Angie Vengco, Public Health(Health Sciences) (U)

Question: What recruitment strategy yielded the most participants in a community

and clinic-based oral health study?

Background: There is little data available about how to successfully recruit Mexican-origin young adults in research studies. Recent U.S. political climate and fear of government may make this group less likely to become a research participant.

Methods: T rained research assistants and clinic staff conducted community outreach and clinic patient in-reach with a goal of enrolling 50-80 Mexican- origin adults for interviews (40/ max) from rural Imperial (IC) and urban San Diego Counties (SD), CA during August-November, 2018. A bilingual scale in both English/Spanish will be developed. This required a need for recruiting a diverse balanced sample of both men and women, between 21-40 years old, who spoke English or Spanish, lived in target areas, and were either married or single. Recruitment modality patterns and participant characteristics were tracked and entered into databases in excel, and access to identify the most effective research strategies (in-reach vs. outreach) at each site. Descriptive and bivariate analysis (Fisher's Exact test) were conducted in SPSS

Results: O f 72 participants enrolled, analysis by recruitment modality revealed that most 75% were recruited through community outreach efforts. By site, of the 40 enrolled in IC, 45% were male, 48% were single, 53% preferred speaking Spanish and 80% were recruited by outreach efforts. Environmental factors in rural IC included weather and foot traffic at events (job fairs, clinic presentations). In SD, of 32 participants, 47% were male, 50% were single, 57% preferred speaking Spanish, and 84% were recruited through outreach at events (national health fair, tamale festival). The urban location of SD is more populous with people and more re-occurring events to attend. There was not a significant difference in recruitment modality by study site.

Discussion/ Conclusion: T he most effective recruitment strategy for Mexican-origin adults was from in-person community outreach efforts at both sites. It is important to examine recruitment modality and the characteristics associated with who enrolled sample in health research studies to avoid systematic bias in research studies.

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572 9:45 am

How do Electronic Health Records (EHR) Compare to Self-Reported Health Survey Data?

Lance Attiq, Public Health (U)

Background: The difference between self-reported and provider-reported oral health-related data presents challenges when looking at oral health disparities on a large scale.

The purpose of this study was to examine the correlation between self-reported data and Electronic Health Record (EHR) information regarding dental insurance status, and associations with primary language spoken, age, and sex among Hispanics.

Methods: Data for this analysis came from Oral Health Behavior Social Support Study 1, with n=72; 40 from Imperial County, and 32 from San Diego County. The study goal was to develop a social support scale for oral health behaviors through interviewing and surveying Hispanic adults aged 21-40 years old. All participants completed an interviewer-administered survey in either English or Spanish. Sixteen study participants were registered patients at Clinicas de Salud del Pueblo (CDSDP), the partner clinic in Imperial County, CA. Eleven study participants were registered patients at Vista Community Clinic (VCC), the partner clinic in north San Diego, CA. Participants agreed to allow access to their EHR as part of this study. Select information, specifically, type of dental insurance, primary language, and tooth loss, were available in both the EHR and study survey.

This analysis used univariate and chi-square bivariate statistics to examine the correlation between self- and provider-reported dental insurance status among Hispanics. This is a work in progress, and further analysis will be done to examine additional associations.

Results: Of 27 participants who consented to allow access to their EHR, 70% had dental insurance (public or private). All participants, excluding one, accurately reported whether or not they had dental insurance. Statistical tests were run, but the data distribution did not meet basic assumptions and requirements for analysis for dental insurance variable. The chi-square test did show that primary language was not associated with dental insurance status.

Conclusion: Clinic patients accurately self-reported their dental insurance status in the study survey as compared to provider-reported dental insurance status. Self-report is reliable for collecting this information.

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573 10:00 am

Rompiendo Fronteras: A Qualitative Investigation of Mentors and Gang-Involved Youth in Cali, Colombia

Tyler Linvill, Public Health & Latin American Studies (M)

Many psychological theories prescribe moderation, or that the relation between a dependent and independent variable changes according to a moderating variable. Researchers typically test for moderation using an interaction term in regression analysis, and decompose the interaction by calculating simple slopes. Typically, researchers to calculate simple slopes at one sample standard deviation above and below the moderator's sample mean, and then use the simple slopes (along with their p-values, confidence intervals, and effect sizes) to gauge the degree to which sample data support a theory. However, that practice does not account for the sampling variability of the sample mean and standard deviation (i.e., that practice assumes that the standard error of the sample mean and standard deviation equals 0), which leads to an underestimate of the p-value for the simple slope (i.e., an increase Type-1 error rate). This talk describes and compares an alternative method for estimating simple slopes that accounts for the sampling variability of the sample mean and sample standard deviation. The results will be demonstrated through empirical example to show how researchers may account for this source of sampling variability.

574 10:15 am

Use of Community Based Participatory Research among Queer Adolescents

Amanda Farr, Public Health (M)

Under the framework of Critical Youth Empowerment Theory (CYET), researchers recognize the integration of youth as partners in research as a tool of empowerment. It is unclear how these researchers are utilizing queer youth as partners in research, and if the way researchers are engaging queer youth is impacting their quality of life and health decisions. The purpose of this integrative review is to assess the current use of CBPR in the queer adolescent community and analyze the fidelity with which it is implemented in this population. In order to select published research studies, the author searched the PUBMED, CINAHL, PROQuest, and Psy INFO using MeSH heading, keyword, and topic searches. Combinations of the key phrases: Community-based participatory research, Youth Participatory Action Research, YPAR, CBPR, youth, student, child, adolescent, queer, LGB*, lesbian, gay, bi*, and trans* were utilized. Using the PRISMA process for systematic literature reviews, titles, abstracts and full text were analysed as needed for inclusion and exclusion criteria. Additionally, a manual search of the reference lists of included articles was completed. Included articles are currently under review by two independent raters. Once rated, the author will run a weighted kappa to determine which aspects of CBPR were most commonly incorporated in the research approach, and which aspects of CBPR were most likely to be present, or absent, in studies with highly rated research methodology. Current analysis shows few studies utilize queer youth partners throughout the entire research process. While there has been a growing effort to include minors in research, individuals under the age of 18 have typically been used as a source of data, rather than partners in the collection and analysis of their data. Adult-led research opens the potential of missing important conclusions contingent on having youth partner perspective. Previous research has indicated that adolescent and youth populations are more likely to implement and utilize the results of research, when youth partners have been involved throughout the entire research process. Potential for youth-led research and youth partnerships exists when academic researchers are willing to make the necessary accommodations.

Session H-6

Oral Interdisciplinary 15

Saturday, March 2, 2019, 9:00 am

Location: Templo Mayor

575 9:00 am

Novel Extrapolations of Energy Calculations

Ken Luu, Physics (U)

One can calculate nuclear energy levels in the interacting shell model but often large dimension make the problem comutationally intractable even with modern supercomputers. This motivates us to seek accurate extrapolations of the energy from calculations in truncated spaces to the full space. I investigate the convergence of shell model ground state energy for selected nuclides as as a function of the truncation dimension, using least sqaures. I tried a novel generalization to provide more data for my fits.

576 9:15 am

Novel Su-8 Based Multi-layer Microstructures for Crispr Applications

Colin O'Neill, Mechanical Engineering (M)

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) is a novel technique inherent in some bacteria that allows for the alteration of DNA. In bacteria, it is used to defend against viruses, but in human DNA CRISPR can be used for a variety of purposes. Paired with a CAS-9 protein, CRISPR can be used to create direct programmable DNA insertion/deletions. This will replace a nonspecific, clumsy DNA-editing mechanism, and is poised to revolutionize the biological industry. There is debate about the ethical implications of using CRISPR, but there is no doubt about its impending prevalence in disease treatment and personalized therapeutics. CRISPR technology is reliant on novel mechanisms to transfect a cell, and many independent researchers are exploring mechanisms to improve transfection. Micro Electrical Mechanical Systems (MEMs) provide an improvement to current state of the art. As a basis for rapidly prototyping MEMs devices, SU-8 is a substantial precursor to create a micro electroporation device for improved transfection for CRISPR applications. SU-8

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microfabrication enables rapid prototyping early in the design process while providing process pathways to semiconductor material properties. A SU-8 fabrication method that utilizes a polymer material which can then serve as the final product: a glassy carbon micro electroporation fluidic chip will be introduced in this thesis. The key outcome of this work is the development of a novel device and fabrication technique to produce microscale electroporation devices consisting of multiple layers of the SU-8 polymer that will become a multilayer glassy carbon structure to improve sample preparation for CRISPR applications.

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577 9:30 am

The Nuclear Equation of State as predicted by the Thomas-Fermi Model

Jon Parsons, Computational Science (M)

The nuclear Thomas-Fermi (NTF) model is a relatively simple but robust model for the determination of the equation of state of nuclear matter. The model successfully replicates several known properties of atomic nuclei and nuclear matter. The model is also simple to calculate. These are distinct advantages over non-relativistic Schroedinger-based treatments or relativistic field-theoretical models of nuclear matter. In order to explore the Thomas-Fermi model, a numerical program has been written from scratch which calculates models for the nuclear equations of state at various densities and neutron-to-proton ratios, where the modern state-of-the-art nucleon-nucleon interaction of Myers and Swiatecki is used as an input. As shown in this presentation, the results for the nuclear equation of state are in excellent agreement with the outcome of more sophisticated treatments of dense nuclear matter. The numerical program is easy to expand further, to finite temperatures as well as catalyzed nuclear matter relevant for the study of compact astrophysical objects.

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578 9:45 am

Modeling Intracellular Delay in Within-host HIV Dynamics under conditioning of Drugs of Abuse

Michael Peter, Applied Mathematics (M)

Drugs of abuse, such as opiates, have been widely associated with the enhancement of HIV replication, the acceleration of disease progression, and severe neuropathogenesis. In particular, the presence of drugs of abuse switches target cells (CD4+ T cells) from lower-to-higher susceptibility to HIV infection. The effect of such switching behaviors on viral dynamics may be altered due to the intracellular delay (the replication time between viral entry into a target cell and the production of new viruses by the infected cell). In this study, we develop, for the first time, a viral dynamics model that includes an intracellular delay under the conditioning of drugs of abuse. We parameterize the model using experimental data from simian immunodeficiency virus infection of morphine-addicted macaques. Results from thorough mathematical analyses and numerical simulations of our model show that the intracellular delay can play a significant role in HIV dynamics under conditioning of drugs of abuse. Our model and the related results give new insights into the HIV dynamics, and may help in the development of strategies to control HIV infections in drug abusers.

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579 10:00 am

The investigation of moving objects through atmospheric turbulence from a nonstationary platform

Nicholas Ferrante, Applied Mathematics (M)

In this talk, I introduce a method to extract the optical flow corresponding to moving objects from a flow field that is impacted by both global camera motion and atmospheric turbulence. The proposed method exploits the geometric structures within the optical flow and isolates the distinct flow components that correspond to the global camera motion, the image turbulence, and the moving objects. I show that the resulting flow field corresponding to moving objects can be used for detecting moving objects in videos captured from a moving camera, viewing a scene containing atmospheric turbulence. The efficacy of the proposed method is demonstrated on a real-world dataset.

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580 10:15 am

Machine learning of load-balancing for a large parallel code

Jordan Fox, Computational Science (D)

Load-balancing is a ubiquitous problem in high-performance computing (HPC), and it is often constrained by physics in scientific codes. This work uses state of the art machine learning (ML) techniques to assist load-balancing in highly parallelized runs of BIGSTICK, a configuration-interaction nuclear shell-model code. BIGSTICK breaks up work into bundles of operations which are in turn distributed over MPI processes. Our challenge is to accurately predict the time each bundle will take to compute, so that the total work can be distributed efficiently. We turn to sophisticated ML techniques to predict compute-time of bundles by their physical features. By training random forest and gradient boosted trees classification models on bundles from many BIGSTICK runs, we can predict bundle cost more accurately and in turn execute more efficient runs on world-class supercomputers.

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Session I-1

Oral Interdisciplinary 16
Saturday, March 2, 2019, 11:00 am
Location: Pride Suite

581 11:00 am

Dr. Ben Yellen and His One-Man Crusade

Lynda Grijalva, Social Science Single Subject Teaching (U)

"Never write one letter. Always write 400." This was Dr. Ben Yellen's motto, and the only quote of his that was included in his Los Angeles Times obituary. No other quote could define Dr. Yellen's legacy more, considering he spent half his life typing away on his locally purchased mimeograph machine, protesting against the social and economic unfairness large-scale farmers bestowed upon Imperial Valley natives and its small town farmers. What started out as a means to voice his opposition against the Bracero Program, Dr. Yellen soon found himself in a whirlwind of lawsuits against rich farmers, the Imperial Irrigation District, and towards the end of his life, Janet Reno, the Attorney General of the United States - a lawsuit that wouldn't fully come to fruition due to Dr. Yellen's death in 1994.

A human rights and social justice activist, Dr. Yellen frequently took to his mimeograph machine when local politics ruffled his feathers, printing off thousands of his 8 ½" x 14" yellow newsletters in his lifetime, and distributing them throughout the Imperial Valley. According to the 1971 issue of The Washington Monthly, you could find Dr. Yellen standing in El Centro with a canvas bag on each shoulder, a picket sign in one hand and handing out newsletters with the other (40). Slipping his newsletters "into the mailboxes of the townspeople, hundreds of Senators, Congressmen, presidential advisors, newspapers, and college professors" (Kinsley 40), he was deemed with the nickname, "The Local Pamphleteer."

My research presentation will focus on Dr. Yellen, a transplant of the Imperial Valley, a one-man crusader with his "yellow sheets," and the important role he played in bringing to light the mistreatment of Braceros, issues with local land and water rights, and exposing affluent corporate farmers for who they really were.

582 11:15 am

Caging for profits: Rethinking the neoliberal state and the rise of the prison industrial complex in the U.S.

ALIONA GALKINA, Human Geography and Global Studies (U)

The United States incarcerates a larger number of citizens than any other country in the world. The overwhelmingly high proportion of African-American prison population is a legacy of deeply racist policies and in many cases can be traced to the times of slavery in the U.S. The rise of anti-immigration rhetoric, heavily targeting migrants from Mexico and Central America, can be seen as an extension and reworking of such racist policies in a country ran overwhelmingly by the White male elite. Beginning with the Clinton years and heavily intensified under the current administration, immigration detention has evolved into yet another form of mass incarceration in the U.S., further expanding the boundaries of what is commonly referred to as the prison industrial complex (PIC). Asylum-seeking refugees are being treated as criminals posing a threat to the well-being and integrity of the American society and also importantly- as a source of profit in the capitalist economy. This research project examines the emergence and expansion of the PIC in the United States through the perspective of economic geography. By engaging in concepts and theories in economic geography, I am interested in analyzing the PIC as a lens onto broader discussions about uneven and highly racialized geographies of capitalist development. I thereby aim to bring attention to the interconnected socio-spatial and political-economic processes and dynamics that contributed to the formation of the PIC. My specific goal is to investigate the role of the state in creating the conditions that undergird the PIC, in order to challenge notions about the withdrawal of the state that pervade the literature on the rise of neoliberalism since the 1970s. Instead, I argue that the state must be recognized as an active actor in the capitalist economy, responsible for creating and maintaining conditions under which human bodies are being caged for profit. This research was guided by the literature analysis of secondary sources (predominantly, the scholarly body and news articles), along with the primary data obtained from the governmental and private organization publications and reports.

583 11:30 am

Border Corruption along the United States Border

Moises Cardenas, Public Administration (U)

Compared to other law enforcement agencies, Customs and Border Protection (CBP) and Border Patrol (BP) are particularly prone to corruption. The Department of Homeland Security (DHS) holds an administrative monopoly amongst our borders, this is what makes officers susceptible to corruption. Investigative journalists argue that there have been almost 200 employees and contract workers of the DHS, take nearly $15 million in bribes. The purpose of this study is to provide empirical evidence of border corruption cases in the United States. This is an exploratory research because there is hardly any prior academic research to it. I created a data set based on cases of convicted border officers, and then I coded the data of all 156 arrest cases. I used about 32 different categories to explain the data and try to find a significance in the data. There were some very significant findings amongst the officers that were arrested, a small example being that older officers (ages 36 and up) tend to be more susceptible to immigration crimes, while younger officers (21-35 years of age) tend to be more susceptible to drug related crimes. This is not to say that every young officer has a drug related crime and vice versa. There are different crimes and with different crimes come with different punishments. Every demographic for each officer plays a huge role in the type of corruption they engage in.

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584 11:45 am

Automating Gesture Data Collection and Classification

Davit Soselia, Computer Engineering (U)

We propose a novel method for gathering information about social group formation and maintenance using a wearable device or camera installed in public places. The device passively gathers facial recognition, facial expression embedding, and pose embedding data using a camera, and identifies which individuals consistently appear close-by spatially and temporally, as well as recognizing regular patterns in individual facial expressions and postures within the identified social groups.

The system uses acquired data to generate FaceNet embeddings (Schroff et al., 2015), compact facial expression similarity embeddings (Vemulapalli, 2018), pose embeddings generated through a self-supervised method (Sümer et al., 2017), encodes them spatially and temporarily using time and GPS data, and performs pattern recognition using several methods, including T-SNE dimensionality reduction (van der Maaten et al., 2008), fuzzy c-means clustering, and ANNs; the methods are used to generate possible social groups and score individual memberships within them, as well as to predict which social group compositions reliably predict which facial expressions and postures within which individual members. The results can also be used for automated dataset generation and be employed in future research.

585 12:00 pm

US Troops and Economic Growth in Kuwait

Robert Lasater, Applied Economics (M)

The United States currently has over 215,000 troops deployed to over 163 countries. Because troops are often deployed to countries actively engaged in combat, disentangling direct effects of US troops on economic growth from indirect effects of conflict resolution and stability on growth is an empirical challenge. This paper provides new evidence on the economic impact of troop deployments by studying the troop deployments to Kuwait in early period of Operation Iraqi Freedom. Utilizing synthetic control matching, this paper estimates the effects of an exogenous increase of security from a large deployment of US troops without the destruction of conflict and finds a marked increase in economic growth. I explore mechanisms for growth in expenditures, security umbrella, and diffusion, finding evidence for the growth caused by the security umbrella, lesser by expenditures, and no evidence for effects of diffusion. These findings are in line with existing literature that shows a positive effect of U.S. troop deployments and host nation economic growth.

Session I-2

Oral Humanities, History, Literature, Philosophy 4

Saturday, March 2, 2019, 11:00 am

Location: Park Boulevard

586 11:00 am

Personalities of Plato's Republic

Marcos Santana, Philosophy (U)

In my research I discuss Plato's Republic in which he explains the different personality types of rulers and their cities. I will discuss how these personality types aren't limited to his interpretation, but also how they can be related to us now with our own politicians and people that we see in our day to day lives.

587 11:15 am

"Aristotle's De Anima: The Soul and Capacities"

Emilia Janda, Political Science and Philosophy (double) (U)

This presentation will explore Rebekah Johnston's analysis of the soul as presented in Aristotle's "De Anima". Johnston presents multiple points that seem to be parallel with many of Aristotle's claims; however, she makes it a point to recognize the widespread misinterpretation of the soul only as a set of capacities. I will also argue against some of Johnston's flawed claims.

588 11:30 am

A Contemporary Discussion on Death

Alex Vicknair, Philosophy (U)

A look into ancient and contemporary philosophical metaphysical notions of death applied to a practical issue in ethics. More specifically, the Epicurean notion of death being nothing to the human being due to its status in the realm of non-existence and replies to this thesis in contemporary philosophy. The goal of this presentation will be to establish an idea of the implications of death to the sentient being and apply this idea to another area within ethics for practical use.

589 11:45 am

Aristotle on the Mind and the Parts of Time

Tiffany Harrington, Philosophy (M)

I will argue that, given Aristotle's claim, in the De Anima, that the soul is embodied, he cannot endorse a time (χρόνος)-perception model of thinking. According to Erick Raphael Jimenez's time-perception model of thinking, thinking is the perception of time (i.e., the past, present and future) or of a medium joining prior to posterior. Jimenez contends that thinking is analogous to perceiving time (χρόνος)and that the objects of the mind are analogous to a line, which is a continuous magnitude, while sensation is analogous to a point. A continuous magnitude, according to Jimenez, cannot consist

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of indivisible points. I argue that continuous lines do, in fact, consist of indivisible points, for Aristotle. In the Categories,Topicsand Physics, among other works, Aristotle argues that lines are divisible and consist of points. So, if the mind is analogous to a line and thinking is analogous to perceiving time (χρόνος), then time (χρόνος) must also consist of parts. Aristotle refers to the now or the present as being a "cut of time" (en tomê chronou). A "cut of time" implies that each cut of time is separate (χωριστός). This implies that the present moment is separate (χωριστός) from all of the other moments in time. Further, given Jimenez's analogy, if lines are not divisible into points, for Aristotle, then thinking cannot consist of sensation, which cannot be the case given Jimenez's claim that the soul is embodied, for Aristotle. Overall, I concur with Jimenez's claim that the soul is embodied, although I argue that it contradicts the time-perception model of thinking and the claim that time (χρόνος) does not consist of parts.

590 12:00 pm

To be is to Persist

Dustin Gray, Philosophy (M)

Time is a funny thing. There is constant talk of it amongst us, but how much of that talk do we really take into metaphysical account? I have written elsewhere that, "It is only when our passions are ignited, and our judgment is utilized, i.e. when we begin to actively think about space and time, that the notion becomes confounded."[1] We say things like, "I'm running late." "It took me over an hour to get here." "When will you be arriving." Arguably, statements like these are commonplace, but what does it mean for an object to persist through time. Consider someone saying something like, "My car is filthy, I really need to wash it." Someone may respond by asking, "How did it get that way?" The answer is simple, right? Dirt, dust and other undesirable particles have collected on the surface of the car making it filthy. The appearance of the car has changed. The car's properties have changed. It wasn't always like that though. At one point in the car's career, (if cars have careers), none of that dirt and grime existed on its surface and the car was said to be clean. The fact of the matter is that for the car to get dirty, not only did the spatial location of the dirt and grime need to change, but the extension of time is necessary. So the real answer is that over time, dirt, dust and other undesirable particles have collected on the surface of the car making it filthy.

The same is true of a man growing a beard, of an avocado ripening, and of a human being advancing throughout the various stages of life from infancy to adulthood. We and other objects are changing over time. The main objective of this essay is to answer the question of, how we and other things persist through time?

Session I-3

Oral Behavior and Social Sciences 21
Saturday, March 2, 2019, 11:00 am
Location: Tehuanco

591 11:00 am

Healing Young Minds: Community, Counseling, and Creativity

Tara Block, Public Administration (U)

Black youth have been at the heart of trauma and unrest for years. The state of mental health in the Black community has been an issue which has been swept under the rug for far too long. In the 1980's amid the crack epidemic and the war on drugs, Black youth became a prime target for incarceration. Instead of analyzing the societal and community factors that contributed to high crime rates, the government chose to impose a war on crime in which politicians labeled Black males especially, super-predators. That term came with the notion that Black youth were innately criminal, completely diminishing the public health perspective of confronting the root of crime rates in the Black community which includes addressing mental health and narrowing mental health disparities. In the following research, I have proposed an unconventional yet traditional means of addressing mental health among Black youth using music and poetry. It is my belief that this approach could directly impact economically disadvantaged, at-risk youth. If implemented on a short term basis it could provide an additional tool to nonviolently express their frustrations and feelings of powerlessness through guided art. A possible long term goal would be to reduce incarceration rates among at risk Black youth through creation of a positive community network. This approach will provide an outlet for creative expression and a means to discuss potent mental health issues as well as traumatic experiences that may have taken place in the lives of at-risk and formerly incarcerated Black youth.

592 11:15 am

Empirical Implications of Lunch Break Perceptions on Workplace Outcomes

Christian Ampo, Psychology (U)

Lunch breaks provide employees an opportunity to recharge and maintain healthy well-being; unfortunately, workplace norms in North America have led to negative perceptions on taking lunch breaks. The glorification of busyness in the workplace has led to the growing belief that the most important people are those who forgo their lunch due to their minimal available time and busy schedule, regardless of their productivity level. This common assumption is familiar and relatable to a large portion of the workforce; however, there is a scant amount of literature on the empirical exploration of this phenomenon. The present study explored the relationship of lunch break comfort (LBC; i.e. "how comfortable an employee feels taking a lunch break") with perceived judgment on taking a lunch break (PJLB; i.e. "negative perceptions

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from boss or coworkers on taking a lunch break") and four workplace outcomes: job satisfaction, intention to quit, perceived organizational support, and employee engagement. Additionally, the moderating role of lunch break importance (LBI; i.e. "how important an employee values a lunch break") was explored on the LBC relationships. An archival data set of a lunch break survey of American and Canadian salaried workers (N = 655) was analyzed using moderated multiple regression. Results of these analyses and corresponding implications will be discussed.

593 11:30 am

Understanding the Sociological Factors to the Opioid Crisis in Virginia

Alejandro Contreras, Public Administration (M)

Background: On October 26, 2017, the Trump administration declared the opioid crisis a National Public Health Emergency. Nationally however, the opioid crisis has affected each state differently based on various factors. This study focuses on the relationship between social determinants and opioid use in the state of Virginia in order to better understand and treat the opioid epidemic.

Methods: Data for opioid overdoses and deaths from 2011 to 2017 were obtained from the Virginia Department of Health. The dataset was linked with data from U.S. Census Bureau American FactFinder for sociological factors such as: Income, White Population, Black Population, Total Population, Private Health Insurance, Public Health Insurance, and HIV rates. Chi squared analyses were examined to demonstrate statistical significance relationships between sociological factors and opioid overdoses and deaths. Maps of Virginia, adjusted for population size, were generated to visualize differences in communities. Literature were evaluated to determine current research and legislature in Virginia.

Expected Results: Statistical analyses show a significant difference in type of opioid usage based of socioeconomic status and one's location. The data demonstrate persons with a higher socioeconomic status are more likely to use prescription opioids compared to heroin, while low socioeconomic status corresponds to a higher heroin usage. Similarly, persons in urban areas are more likely to use prescription opioids, while, persons in rural are are more likely to use heroin.

Discussion: Virginia's Department of Health is extremely transparent in disclosing the number of opioid cases in the state. The amount of literature specific to the state of Virginia is lacking however. More research focused on the public health impacts of opioids in Virginia needs to occur in be published in order to produce policies which reflect differences in sociological factors. Finally, more states need to be following Virginia's lead in releasing data in order to better understand the scope of the opioid crisis.

594 11:45 am

Putting the "Participatory" & "Trauma-Informed" in Tobacco Control : A Systematic Review

Charles Marks, Interdisciplinary Research on Substance Use (D)

Over the past several decades, it has become clear that experiences of acute and prolonged trauma and adversity significantly impact health outcomes. Exposure to adverse childhood experiences (ACEs) have been correlated with an increased risk of tobacco use and several tobacco-related health outcomes, including coronary heart disease (CHD) and chronic obstructive pulmonary disorder (COPD). Further, exposure to ACEs and tobacco use are disparately concentrated within vulnerable communities, including many racial minorities, LGBTQ+, and those living in poverty. While tobacco control efforts of the last half-century have significantly lowered the overall rate of smoking in the US, these efforts have failed to lower the rates of tobacco use and related outcomes within these same vulnerable communities because, as we argue, the culture of tobacco control actively disregards the role of trauma or the perspectives of tobacco users. We argue that, in order for tobacco control efforts to provide equitable benefit to vulnerable communities, trauma-informed and participatory methods must be utilized. To support this, we present a model which hypothesizes that tobacco use plays a mediating role between ACEs and tobacco-related health outcomes, as well as the results of a systematic review of literature which quantitatively reflects on this model within US settings. The findings of this review indicate that tobacco use partially mediates the relationship between ACEs and CHD and COPD, supporting our argument that trauma-informed and, by extension, participatory methods must be utilized in future tobacco control efforts.

595 12:00 pm

Resistance Is Resilience

Myra Hollis, Marriage and Family Therapy (M)

Research on adolescents who have excelled in academia is prevalent, but research on students with unique experiences and the narrative of their journey doesn't take up as much of the research. The aim of this study is to learn more about how experiences have affected the ways in which teens make decisions in their lives and explore what factors have contributed to their resilience. Participants were in high school, and they all have had unique experiences within their lives. Participants completed a series of questions with one or both SDSU graduate students in either a face to face setting or via phone. This project analyzes responses from participants in addition to previous research on this population. The potential risk to the participants are minimal, and the benefits from participation outweigh those risks. Participation in the study is strictly voluntary and privacy was protected through usual risk management procedures.

SRS

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