Celebrating the achievements of SDSU student research, scholarship and creative activity.
STUDENT RESEARCH SYMPOSIUM 2013

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

MARCH 8 AND 9, 2013
There are only two outside entrances, one to the Library Addition through the Dome (Entrance 1) and one to Love Library (Entrance 2) on the south side, 2nd floor behind the glass tunnel.
<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maps of Library and Library Addition</td>
<td>2–4</td>
</tr>
<tr>
<td>Welcome from the President</td>
<td>6</td>
</tr>
<tr>
<td>Keynote Speaker</td>
<td>7</td>
</tr>
<tr>
<td>Schedule at a Glance</td>
<td>8–10</td>
</tr>
<tr>
<td>Awards</td>
<td>11</td>
</tr>
<tr>
<td>Awards Reception</td>
<td>12</td>
</tr>
<tr>
<td>Oral and Poster Presentations: Friday</td>
<td>13</td>
</tr>
<tr>
<td>Oral Presentations: Saturday</td>
<td>34</td>
</tr>
<tr>
<td>Abstracts by Session</td>
<td>41</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>211</td>
</tr>
<tr>
<td>Notes</td>
<td>215</td>
</tr>
</tbody>
</table>
March 8, 2013

Dear Colleagues and Guests:

Welcome to the 2013 Student Research Symposium at San Diego State University. This sixth annual symposium is a university wide effort that highlights the outstanding research and creative endeavors that distinguish SDSU. It’s an opportunity to celebrate the innovation and academic scholarship that our undergraduate and graduate students bring to their research and a forum for sharing their discoveries and insights with a broader audience.

More than 450 students are presenting original scholarly work that emerged from academic programs across the university. The students whose entries are judged exceptional will represent SDSU at the annual California State University Student Research Competition in May.

Our dedicated faculty and staff have encouraged students in their research and are coordinating this symposium. More than 250 judges have volunteered to share their time and expertise in evaluating oral and poster presentations. I am grateful for these efforts, which demonstrate SDSU’s commitment to research that addresses national and international challenges.

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

With best regards,

Elliot Hirshman, President
San Diego State University
Stanley Maloy is a native San Diegan. He obtained his PhD in Molecular Biology & Biochemistry from UC Irvine, did a post-doctoral fellowship in Genetics at the University of Utah, then moved to a faculty position in Microbiology at the University of Illinois in Urbana-Champaign where he served as a professor for 18 years. In 2002 he returned to San Diego, and became Dean of the College of Sciences in 2006.

He is the author of over a hundred scientific publications and ten books. He has won multiple awards for teaching. In addition to university teaching, he has organized many conferences and intensive international courses in the US, Europe, Asia, and Latin America.

From 2004–2007 he served as President of the American Society for Microbiology (ASM), a scientific society with 43,000 members and an annual budget of over $100M. For the subsequent eight years he chaired an ASM committee on communicating science to the public.

He has also worked extensively with industry and the federal government—in addition to chairing NIH study sections, he has served on federal advisory groups on biosafety and biodefense, and research and health policy, and he has testified before the United States House Appropriations Committee about federal funding for scientific research.

His research focuses on bacterial and phage genetics and physiology, the evolution of microbial diseases, and the development of new vaccines and antibiotics.
Thursday, March 7  **Registration**
1:00 pm – 4:00 pm  Registration  LA 1103 Tutoring Center

Friday, March 8  **Sessions A and B**
8:00 am – 4:00 pm  Registration  LA 1103 Tutoring Center

**Opening Remarks**
8:30 am – 9:00 am  Elliot Hirshman, President, SDSU  North side of Love Library

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Session Type</th>
<th>Session Title</th>
<th>Presentation Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>A-1</td>
<td>Oral</td>
<td>Disease Prevention, Detection, and Cures</td>
<td>LA 2203</td>
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<tr>
<td></td>
<td>A-2</td>
<td>Oral</td>
<td>Astronomy and Physics</td>
<td>LL 430</td>
</tr>
<tr>
<td></td>
<td>A-3</td>
<td>Oral</td>
<td>Undergraduate Research in Stem Cells</td>
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</tr>
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<td></td>
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<td>Oral</td>
<td>Graduate Research in Biotechnology</td>
<td>LL 260</td>
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<td>Oral</td>
<td>Graduate Research in Molecular Biology</td>
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</tr>
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<td></td>
<td>A-6</td>
<td>Oral</td>
<td>Graduate Research in Biochemistry</td>
<td>LA 78</td>
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<td></td>
<td>A-7</td>
<td>Oral</td>
<td>Evolutionary Biology I</td>
<td>LL 406</td>
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<tr>
<td>9:00</td>
<td>A-12</td>
<td>Poster</td>
<td>Microbiology I</td>
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<td>A-13</td>
<td>Poster</td>
<td>Chemistry I</td>
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</tr>
<tr>
<td></td>
<td>A-14</td>
<td>Poster</td>
<td>Applied Medicine and Public Health</td>
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</tr>
<tr>
<td></td>
<td>A-15</td>
<td>Poster</td>
<td>Construction and Structures</td>
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<td></td>
<td>A-16</td>
<td>Poster</td>
<td>Cardiac Biology I</td>
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<tr>
<td></td>
<td>A-17</td>
<td>Poster</td>
<td>Nanoparticle Toxicity, Formation, and Properties</td>
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<td>A-18</td>
<td>Poster</td>
<td>Astronomy and Mathematics</td>
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<td>A-19</td>
<td>Poster</td>
<td>Research in Psychology</td>
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<td>Oral</td>
<td>Research in Molecular Medicine</td>
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<td></td>
<td>B-2</td>
<td>Oral</td>
<td>Identity and the Self</td>
<td>LL 430</td>
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<td>B-3</td>
<td>Oral</td>
<td>Latin American History and Anthropology</td>
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<td>Oral</td>
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<td>Oral</td>
<td>Graduate Research in Behavioral Science</td>
<td>LL 260</td>
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<tr>
<td></td>
<td>B-6</td>
<td>Oral</td>
<td>Undergraduate Research in Behavioral Science</td>
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<td></td>
<td>B-7</td>
<td>Oral</td>
<td>Latina Health I</td>
<td>LA 76</td>
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<td></td>
<td>B-8</td>
<td>Oral</td>
<td>Music Identity and Memory</td>
<td>LA 78</td>
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<td>B-9</td>
<td>Oral</td>
<td>Popular Music in History</td>
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</tr>
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<td>B-15</td>
<td>Poster</td>
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<td>B-16</td>
<td>Poster</td>
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<td>Poster</td>
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<td>B-19</td>
<td>Poster</td>
<td>Cardiac Biology II</td>
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</table>
## Friday, March 8  
**Sessions C and D**

8:00 am – 4:00 pm  
Registration  
LA 1103 Tutoring Center

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Session Type</th>
<th>Session Title</th>
<th>Presentation Location</th>
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<tr>
<td>1:00</td>
<td>C-1</td>
<td>Oral</td>
<td>Ecological Science</td>
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<tr>
<td></td>
<td>C-2</td>
<td>Oral</td>
<td>World History and Sustainable Development</td>
<td>LL 430</td>
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<tr>
<td></td>
<td>C-3</td>
<td>Oral</td>
<td>Technology, Self, and Society</td>
<td>LL 431</td>
</tr>
<tr>
<td></td>
<td>C-4</td>
<td>Oral</td>
<td>Work, Families, and Policy</td>
<td>LL 410</td>
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<td></td>
<td>C-5</td>
<td>Oral</td>
<td>Graduate Research in Psychology</td>
<td>LL 260</td>
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<td></td>
<td>C-6</td>
<td>Oral</td>
<td>Under and Above Ground Research in Dynamic Communities</td>
<td>LL 261</td>
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<tr>
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<td>C-7</td>
<td>Oral</td>
<td>Health, Food, and Eating</td>
<td>LA 76</td>
</tr>
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<td>C-8</td>
<td>Oral</td>
<td>Education and Identity</td>
<td>LA 78</td>
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<td>Oral</td>
<td>Analytical and Physical Chemistry</td>
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<td>C-10</td>
<td>Oral</td>
<td>Environmental Monitoring</td>
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<td>Poster</td>
<td>Psychology and Public Health</td>
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<td>Poster</td>
<td>Urban and Environmental Research</td>
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<td>Poster</td>
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<td>Bioengineering</td>
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<td>C-16</td>
<td>Poster</td>
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<tr>
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<td>C-17</td>
<td>Poster</td>
<td>Microbiology III</td>
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<td>Poster</td>
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<td>Poster</td>
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<td>C-20</td>
<td>Poster</td>
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<td>3:00</td>
<td>D-1</td>
<td>Oral</td>
<td>US and US Ethnic History</td>
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<tr>
<td></td>
<td>D-2</td>
<td>Oral</td>
<td>Migrants: Social and Psychological Distress</td>
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<tr>
<td></td>
<td>D-3</td>
<td>Oral</td>
<td>Computer Science Application in Biology</td>
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</tr>
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<td>3:00</td>
<td>D-12</td>
<td>Poster</td>
<td>Speech Language Hearing Sciences</td>
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<td>D-13</td>
<td>Poster</td>
<td>Latina Health II</td>
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<td>D-14</td>
<td>Poster</td>
<td>Ecology and Environmental Science</td>
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<td>D-15</td>
<td>Poster</td>
<td>Applied Psychology</td>
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<td>D-16</td>
<td>Poster</td>
<td>Social Psychology</td>
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<td>D-17</td>
<td>Poster</td>
<td>Alcohol and Tobacco</td>
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<td>D-19</td>
<td>Poster</td>
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</tr>
</tbody>
</table>

**Saturday Schedule**

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*LL = Love Library, Main Building  
LA = Library Addition*
### Saturday, March 9  **Sessions E and F**

**8:00 am – 10:00 am**  
Registration  
LA 1103 Tutoring Center

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Session Type</th>
<th>Session Title</th>
<th>Presentation Location</th>
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<td>9:00</td>
<td>E-1</td>
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<td>Education II</td>
<td>LA 2203</td>
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<td></td>
<td>E-2</td>
<td>Oral</td>
<td>Public Health and Social Policies</td>
<td>LL 430</td>
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<td></td>
<td>E-3</td>
<td>Oral</td>
<td>Speech and Language</td>
<td>LL 431</td>
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<tr>
<td></td>
<td>E-4</td>
<td>Oral</td>
<td>Fire and Flames</td>
<td>LL 410</td>
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<tr>
<td></td>
<td>E-5</td>
<td>Oral</td>
<td>Environmental Science</td>
<td>LL 260</td>
</tr>
<tr>
<td></td>
<td>E-6</td>
<td>Oral</td>
<td>Identity: Resistance, Bias, Stereotyping, and Change</td>
<td>LL 261</td>
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<tr>
<td></td>
<td>E-7</td>
<td>Oral</td>
<td>Graduate Research in Cell Biology</td>
<td>LA 76</td>
</tr>
<tr>
<td></td>
<td>E-8</td>
<td>Oral</td>
<td>History and Communities</td>
<td>LA 78</td>
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<tr>
<td></td>
<td>E-9</td>
<td>Oral</td>
<td>Art and Identity</td>
<td>LL 406</td>
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<td></td>
<td>E-10</td>
<td>Oral</td>
<td>Undergraduate Research in Molecular Biology</td>
<td>LL 408</td>
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<tr>
<td></td>
<td>E-11</td>
<td>Oral</td>
<td>Mathematical Modeling and Equations</td>
<td>LA 63</td>
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<tr>
<td>10:45</td>
<td>F-1</td>
<td>Oral</td>
<td>Undergraduate Research in Neuroscience</td>
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<td>Latina Health III</td>
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<td>Oral</td>
<td>Solar Energy and Nuclear Physics</td>
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<td>Oral</td>
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<td>Oral</td>
<td>Antennas and Receivers</td>
<td>LL 260</td>
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<td>F-6</td>
<td>Oral</td>
<td>Fluids and Flows</td>
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<td>F-7</td>
<td>Oral</td>
<td>Graduate Research in Public Health</td>
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<td>F-8</td>
<td>Oral</td>
<td>Graduate Research in Exercise and Kinesiology</td>
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<td>F-9</td>
<td>Oral</td>
<td>Womens’ Agency and Activism</td>
<td>LL 406</td>
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<td>F-10</td>
<td>Oral</td>
<td>Evolutionary Biology II</td>
<td>LL 408</td>
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<tr>
<td></td>
<td>F-11</td>
<td>Oral</td>
<td>Geography: Images of Community</td>
<td>LA 63</td>
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</table>

**12:00 – 1:15 pm**  
Lunch Reception  
North side of Love Library

**1:30 – 2:30 pm**  
Keynote Address and Awards Presentation  
Smith Recital Hall (Music Bldg.)

**Keynote Speaker:** Stanley Maloy, Dean, College of Sciences, SDSU
Awards will be presented at the Reception on Saturday, March 9, to recognize the most outstanding presentations of research, scholarship, and creative activity at the Student Research Symposium. These are:

**President’s Awards**
One President’s Award will be given to the most outstanding presentation in each of the five categories—Physical Sciences; Health Studies and Life Sciences; Engineering, Informatics and Business; Humanities, Creativity, and the Arts; and Social, Behavioral and Educational Studies—and then to the next five highest rated presentations across all categories.

Those receiving a President’s Award will represent San Diego State University at the California State University (CSU) Student Research Competition on May 10 and 11, 2013 at California State Polytechnic University, Pomona.

**Provost’s Awards**
Twelve Provost’s Awards of $150 each will be given for the most outstanding poster presentations across all categories.

**Dean’s Awards**
Dean’s Awards of $250 each are given for oral presentations. Two awards will be given to the top two presentations in each college and one award given to the top presentation from the Imperial Valley Campus.

**Scholars Without Borders/International Award**
Scholars Without Borders is an honorary society dedicated to promoting international exchange and service and recognizing scholarly achievement in an international context.

**The Charles Wei-hsun Foundation Award for Research in Philosophy**
The Department of Philosophy will award $500 for the best oral presentation in Philosophy.

**Library Awards**
Four awards from the Library of $250 each (two undergraduate and two 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**
The top ten undergraduate presentations, following those receiving a President, Dean and Provost award, will receive a certificate of recognition for their scholarly achievement. These students will be selected from both oral and poster presentations.

**Outstanding Compact Scholar Researcher Award**
The Division of Undergraduate Studies will award $250 for the undergraduate researcher with the highest scoring oral or poster presentation that is also a member of the Compact Scholars Program. Compact Scholar eligibility must be verified before the award is issued. An additional $250 will be awarded to cover travel expenses for the undergraduate researcher to present his/her research in another conference in order to support the student in their effort to continue to be engaged in research beyond the SRS experience.

**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 (2 for graduate students and 2 for undergraduates) are presented jointly by the Chief Diversity Officer, the Division of Graduate and Research Affairs, and the Division of Undergraduate Studies for the best research presentations that exemplify our ongoing commitment to diversity, inclusion, and social justice.
Saturday, March 9, 2013

Reception: 12:00 pm – 1:15 pm, North side of Love Library

Keynote Address and Awards Ceremony: 1:30 – 2:30 pm, Smith Recital Hall (Music Building)

Saturday afternoon events are open to all student presenters, mentors, and judges.

Welcome

Keynote Address
Stanley Maloy, Dean, College of Sciences

Award Ceremony and Student Recognition

Research Awards for Diversity, Inclusion and Social Justice
   Janet Abbott, Director, Compact Scholars Program
   Aaron Bruce, Chief Diversity Officer
   Stephen Welter, Vice President for Research and Dean of Graduate Affairs

Outstanding Compact Scholar Researcher Award
   Janet Abbott, Director, Compact Scholars Program

Undergraduate Research Excellence Awards
   Kathy Williams, Interim Associate Dean, Division of Undergraduate Studies

Library Awards
   Gale Etschmaier, Dean, Library and Information Access

The Charles Wei-hsun Foundation Award for Research in Philosophy
   Sandra Wawrytko, Associate Professor, Philosophy

Scholars Without Borders/International Award
   Sandra Wawrytko, Associate Professor, Philosophy, Board Member, Scholars Without Borders

Dean’s Awards
   Paul Wong, College of Arts and Letters
   Michael Cunningham, College of Business Administration
   Ric A. Hovda, College of Education
   David T. Hayhurst, College of Engineering
   Marilyn Newhoff, College of Health and Human Services
   Gale Etschmaier, Library and Information Access
   Joyce M. Gattas, College of Professional Studies and Fine Arts
   Stanley Maloy, College of Sciences
   David E. Pearson, Imperial Valley Campus

Provost’s Awards
   Nancy A. Marlin, Provost

President’s Awards
   Stephen Welter, Vice President for Research and Dean of Graduate Affairs

Closing Remarks
   Emilio Ulloa, Chair, SDSU Student Research Symposium
Sessions: Friday, March 8, 2013

Session A-1
Oral Presentation:
Disease Prevention, Detection, and Cures
Friday, March 8, 2013, 9:00 am
Location: Library Addition 2203

100  9:00 am
Azaspirene: A newer, milder and patient-friendly treatment for cancer
Juan Rodriguez, Chemistry (U)

101  9:15 am
Analysis of Oral Microbiota in Human Cancer Subjects
Erin Fletcher, Microbiology (U)

102  9:30 am
The effects of contaminated fish oil supplementation on lipid profile, inflammation and antioxidant levels
Valerie Wright, Foods and Nutrition (U)

103  9:45 am
Correlates of Hepatitis C Antibody Testing among Injection Drug Users in San Diego, CA
Sandeep Bhaurla, Epidemiology (M)

104  10:00 am
Effects of cayenne pepper on antioxidant capacity, antioxidant enzyme activity, inflammation and lipid profiles in DSS treated rats fed an atherogenic diet
Kyrie Baca, Nutritional Science (M)

105  10:15 am
AMPK-mTOR Signalling Mediated Cardiac Autophagy Is Repressed In The Context Of Metabolic Syndrome In Various Animal Models Of Metabolic Syndrome
Nandini Ravindran, Biology (M)

106  10:30 am
Ultrasensitive Detection of Biomarkers for Neurodegenerative Diseases by Multi-Photon Nonlinear Laser Wave-Mixing Optical Detection and Capillary Electrophoresis
Manna Iwabuchi, Chemistry (D)

Session A-2
Oral Presentation: Astronomy and Physics
Friday, March 8, 2013, 9:00 am
Location: Love Library 430

107  9:00 am
The syzygy of KIC 4150611
Trevor Gregg, Astronomy (U)

108  9:15 am
Mass and Radius Measurements of the Kepler Eclipsing Binary Star System KIC 8736245
Tara Fetherolf, Astronomy (U)

109  9:30 am
The Radius of the Super-Earth Planet Kepler-9d
Justin Stevick, Astronomy (M)

110  9:45 am
What is the ultimate fate of our Universe?
Joseph Fedrow, Astronomy (M)

111  10:00 am
Detecting Lyman Break Galaxies in the early universe and improving the selection technique
John Horst, Astronomy (M)

Session A-3
Oral Presentation:
Undergraduate Research in Stem Cells
Friday, March 8, 2013, 9:00 am
Location: Love Library 431

112  9:00 am
Development of an iPSC based screening platform for Parkinson’s disease drug discovery
Cody Smith, Biology (U)

113  9:15 am
PSC Derived Familial Alzheimer’s Diseased Neurons as a Model for Alzheimer’s Pathology and Drug Therapy Investigation
Patrick Reilly, Biology (U)

114  9:30 am
A Stem Cell Based Approach to Treating Multiple Sclerosis Using Drug-Like Small Molecules
Chelsea Green, Chemistry (U)
**Session A-4**

**Oral Presentation:**
Graduate Research in Biotechnology
Friday, March 8, 2013, 9:00 am
Location: Love Library 260

118 9:00 am  
**Anaerobic Codigestion of Fats, Oils, and Grease**  
Tyler Kirkendall, Environmental Engineering (U)

119 9:15 am  
**A novel high-throughput cell-based assay allows for the screening of peptide libraries targeting HIV-1 envelope processing**  
Zachary Stolp, Cellular and Molecular Biology (M)

120 9:30 am  
**Autologous Blood Doping Screening Through Capillary Electrophoresis**  
Chuan (Jack) Fang, Chemistry (M)

121 9:45 am  
**Planarians as a model to investigate factors regulating adult neurogenesis**  
Martis Cowles, Biology (D)

122 10:00 am  
**Addition of a Short Beta-Hairpin Sequence Enhances Recombinant Expression of Two Small Helical Domains**  
Melissa Lokensgard, Biochemistry (D)

123 10:15 am  
**RNAi in Ascidians: Developing a tool to knockdown gene expression in Ciona intestinalis**  
Victoria Hurless, Biology (D)

124 10:30 am  
**A novel C5a-derived immunobiotic peptide promotes pathogen clearance in vivo through targeted bacterial killing**  
Katy Patras, Biology (D)

**Session A-5**

**Oral Presentation:**
Graduate Research in Molecular Biology
Friday, March 8, 2013, 9:00 am
Location: Love Library 261

125 9:00 am  
**Investigation of lambda phage-like systems in marine microbial communities from Iquique, Chile and the Abrohlos Bank, Brazil**  
Noriko Cassman, Bioinformatics (M)

126 9:15 am  
**Cystic Fibrosis Transmembrane Conductance Regulator (CFTR)-like Protein in Hydra vulgaris**  
Michelle Petitfils, Microbiology (M)

127 9:30 am  
**Analysis of Copper Genes in Vibrios**  
Shashank Sathe, Bioinformatics (M)

128 9:45 am  
**Virus-Induced Formation of Exosomes and Coxsackievirus Dissemination in the Host**  
Vrushali Mangale, Biology (M)

129 10:00 am  
**Characterizing phenotypic properties of unexplored viral genes**  
Daniel Cuevas, BIOMI (M)

130 10:15 am  
**The gene modification of Ig-like domain on the major head protein of T3 bacteriophage**  
Shr-Hau Hung, Microbiology (M)

131 10:30 am  
**Regulation of Tight Junction Complexes in Brain Endothelium by the Meningeal Pathogen, Group B Streptococcus**  
Brandon Kim, Biology (D)

**Session A-6**

**Oral Presentation:**
Graduate Research in Biochemistry
Friday, March 8, 2013, 9:00 am
Location: Library Addition 78

132 9:00 am  
**Structure-activity studies of a peptide that inhibits DNA repair**  
Gabriel Vahi-Ferguson, Biology (U)
133  9:15 am
Identification of new protein interactions of UNC-45, a myosin molecular chaperone, in Drosophila melanogaster
Carmen Carland, Cellular and Molecular Biology (M)

134  9:30 am
Recognition of G-rich IRE sequence DNA by the NF-kappaB p50 homodimer
Ashlee King, Chemistry (M)

135  9:45 am
A Structural Basis for IkappaB Kinase Activation via Oligomerization Dependent trans Autophosphorylation
Arthur Hauenstein, Chemistry (D)

136  10:00 am
Mechanism of General transcription factor association with the TATA box of U6 snRNA gene promoters
Jin Joo Kang, Chemistry and Biochemistry (D)

Session A-7
Oral Presentation: Evolutionary Biology I
Friday, March 8, 2013, 9:00 am
Location: Library Addition 76

137  9:00 am
Genetic species delimitation and species tree inference in the Sitalcina sura species group (Opiliones, Laniatores)
Angela Didomenico, Evolutionary Biology (M)

138  9:15 am
The phylogeography of the Sidewinder (Crotalus cerastes) using relaxed clock phylogenetics
John Andermann, Evolutionary Biology (M)

139  9:30 am
Multilocus Species Delimitation and Species Tree Inferences Within the Western Rattlesnake Species Complex
Julianne Goldenberg, Biology (M)

140  9:45 am
Can you hear me now? Form and function in whale earbones
William Ary, Biology (M)

Session A-12
Poster: Microbiology I
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

141  Poster #1  9:00-10:45 am
Optical Bacterial Growth Sensor Based on Ultrathin Iron Oxide Films
Dominic Goria, Biology (U)

142  Poster #2  9:00-10:45 am
Microbial Database
Dwaine Smith, Biology (U)

143  Poster #3  9:00-10:45 am
Characterizing unknown genes through metabolomics
Tiffany Liang, Bioinformatics and Biomedical Informatics, (M)

144  Poster #4  9:00-10:45 am
In Search of a Genetic Explanation for Drug Resistance in Mycobacterium Tuberculosis (Mtb)
Victoria Zadorozhny, Bioinformatics (M)

145  Poster #5  9:00-10:45 am
Cancer Biomarkers
Laura Buehning, Public Health (M)

146  Poster #6  9:00-10:45 am
Waist to hip ratios predict odor recognition memory processing speed in carriers of the Apolipoprotein e 4 allele
Melissa Cervantez, Psychology (M)

Session A-13
Poster: Chemistry I
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

147  Poster #7  9:00-10:45 am
Development of an in vitro functional assay for myosin folding by the UNC-45 chaperone protein
Cathrine Aivati, Biology (U)

148  Poster #8  9:00-10:45 am
Electrochemical Studies of possible new drugs to treat Chagas Disease
Ramsis Ramsis, Chemistry (U)

149  Poster #9  9:00-10:45 am
Stereospecific synthesis of Lagunamide A
Maxfield Fröhlich, Biology (U)
<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>9:00-10:45 am</td>
<td>Supramolecular Assembly using Organic Radical Pi Dimers. Measurement of Dimerization constants using UV-vis Spectroscopy</td>
<td>Shaminee Keenawinna, Chemistry (U)</td>
</tr>
<tr>
<td>11</td>
<td>9:00-10:45 am</td>
<td>Does the Antibiotic Virginiamycin S1 Have Different Conformations When Dissolved in Different Solvents</td>
<td>Sarah Jane Ferrer, Chemistry, emphasis in Biochemistry (U)</td>
</tr>
<tr>
<td>12</td>
<td>9:00-10:45 am</td>
<td>Sensitive Analysis of Neurotransmitters by Laser Wave-Mixing Spectroscopy and Capillary Electrophoresis</td>
<td>Linda Honaker, Chemistry/Biochemistry (U)</td>
</tr>
<tr>
<td>13</td>
<td>9:00-10:45 am</td>
<td>Analysis of the Reduction of 1,2-Dimethyl-5-nitroimidazole Using Cyclic Voltammetry</td>
<td>Karen An Ronquillo, Biochemistry (U)</td>
</tr>
<tr>
<td>14</td>
<td>9:00-10:45 am</td>
<td>Awareness and Treatment Related to Blood Pressure in San Diego Community</td>
<td>Katherine Nicole Padiernos, Nursing (U)</td>
</tr>
<tr>
<td>15</td>
<td>9:00-10:45 am</td>
<td>A Kinematic Analysis of Chewing in Children with Cerebral Palsy</td>
<td>Lucia Kearney, Speech, Language, &amp; Hearing Sciences (U)</td>
</tr>
<tr>
<td>16</td>
<td>9:00-10:45 am</td>
<td>Developing an assay for modeling psychiatric disorders in vivo</td>
<td>Anna Tarabrina, Kinesiology (U)</td>
</tr>
<tr>
<td>17</td>
<td>9:00-10:45 am</td>
<td>Nutritional Health Status of Homeless Veterans in San Diego</td>
<td>Maricris Cruz, Nursing (U)</td>
</tr>
<tr>
<td>18</td>
<td>9:00-10:45 am</td>
<td>Association of Physical Activity and Life Satisfaction to Health-Related Quality of Life in Hodgkin Lymphoma Survivors, Behavioral Risk</td>
<td>Alexandria Blacker, Public Health (M)</td>
</tr>
<tr>
<td>19</td>
<td>9:00-10:45 am</td>
<td>Scald burns presenting at South African Hospitals</td>
<td>Ashley Gevaart-Durkin, Public Health (M)</td>
</tr>
<tr>
<td>20</td>
<td>9:00-10:45 am</td>
<td>Case study on the feasibility of using a low-cost device to track balance ability in an individual with multiple sclerosis</td>
<td>Brian Cone, Kinesiology-Rehabilitation Science (M)</td>
</tr>
<tr>
<td>21</td>
<td>9:00-10:45 am</td>
<td>Dome Window and Mount Design for a Large Scale Solar Receiver</td>
<td>E-Fann Saung, Mechanical Engineering (M)</td>
</tr>
<tr>
<td>22</td>
<td>9:00-10:45 am</td>
<td>Building Information Modeling and Field Operations: An Exploratory Study</td>
<td>Britani Harris, Construction Engineering (M)</td>
</tr>
<tr>
<td>23</td>
<td>9:00-10:45 am</td>
<td>An Analysis of High Reliability Foremen in Heavy-Civil Construction</td>
<td>Alejandro Mendoza, Civil, Construction, and Environmental Engineering (M)</td>
</tr>
<tr>
<td>24</td>
<td>9:00-10:45 am</td>
<td>Non Linear Aeroelastic Analysis of Joined Wing Configurations</td>
<td>Rauno Cavallaro, Aerospace Engineering (D)</td>
</tr>
<tr>
<td>25</td>
<td>9:00-10:45 am</td>
<td>Seismic Performance of Steel Anchor Bolts for Nonstructural Components</td>
<td>Timothy Johnson, Structural Engineering (D)</td>
</tr>
<tr>
<td>26</td>
<td>9:00-10:45 am</td>
<td>Fluctuations of Calcium Signaling and the effects in Neonatal Cardiocytes</td>
<td>Jterrell Moore, Engineering (U)</td>
</tr>
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</table>

Session A-15
Poster: Construction and Structures
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>21</td>
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<td>9:00-10:45 am</td>
<td>Seismic Performance of Steel Anchor Bolts for Nonstructural Components</td>
<td>Timothy Johnson, Structural Engineering (D)</td>
</tr>
</tbody>
</table>

Session A-16
Poster: Cardiac Biology I
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
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<tr>
<td>26</td>
<td>9:00-10:45 am</td>
<td>Fluctuations of Calcium Signaling and the effects in Neonatal Cardiocytes</td>
<td>Jterrell Moore, Engineering (U)</td>
</tr>
</tbody>
</table>
167 Poster #27  9:00-10:45 am  
*Unpaced Neonatal Cardiocyte Dynamics in Culture*  
Jeremy Mitchell, Physics (U)  

168 Poster #28  9:00-10:45 am  
*Sorcin modulates mitochondrial calcium handling by increasing the mitochondrial calcium uniporter (MCU) in cardiomyocytes*  
Angelica Suarez-Ramirez, Biology (U)  

169 Poster #29  9:00-10:45 am  
*Trapping and characterizing DNA repair intermediates in vivo*  
Nishtha Agrawal, Biology (M)  

170 Poster #30  9:00-10:45 am  
*Autophagy in the Aging Heart*  
Michael Gurney, CMB (D)  

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**Session A-17**  
**Poster:**  
*Nanoparticle Toxicity, Formation, and Properties*  
Friday, March 8, 2013, 9:00 am – 10:45 am  
Location: Library Dome  

171 Poster #31  9:00-10:45 am  
*Size Does Matter: The Smallest GaSe Nanocrystals*  
John-David Lyons, Biology (U)  

172 Poster #32  9:00-10:45 am  
*Solving Mystery of CdSe magic-sized nano-crystals with centrifugation*  
Anthony Rosado, Chemistry (U)  

173 Poster #33  9:00-10:45 am  
*Formation mechanism of CdSe Magic Size Nanocrystals*  
Matthew Lacroix, Chemistry (U)  

174 Poster #34  9:00-10:45 am  
*Investigating the Toxicity of Silver Ions to Chronically Exposed Nitrifying Bacteria*  
Issa El Haddad, Civil Engineering (U)  

175 Poster #35  9:00-10:45 am  
*Silver Ion Affinity Studies*  
Anna Uribe, Environmental Engineering (U)  

176 Poster #36  9:00-10:45 am  
*Comparison of the Environmental Impacts of NiO and Cr2O3 Nanoparticles*  
Matthew Tallone, Environmental Engineering (U)  

177 Poster #37  9:00-10:45 am  
*Synthesis and Toxicity of Silver Nanoparticles with Different Capping Agents and Shapes*  
Alyssa Deline, Chemistry (U)  

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**Session A-18**  
**Poster:**  
*Astronomy and Mathematics*  
Friday, March 8, 2013, 9:00 am – 10:45 am  
Location: Library Dome  

178 Poster #38  9:00-10:45 am  
*Reduction of Order for Higher Order Linear Ordinary Differential Equations*  
Nadia Ott, Mathematics (U)  

179 Poster #39  9:00-10:45 am  
*Visualizing the Kepler Project*  
Grace Mervin, Astronomy (U)  

180 Poster #40  9:00-10:45 am  
*The Effect of Gravitational Lensing on Dark Energy Measurements*  
Carolina Galindo, Astronomy (U)  

181 Poster #41  9:00-10:45 am  
*Relative Nova Rates in Three Virgo Elliptical Galaxies with Differing Globular Cluster Specific Frequencies*  
Chris Curtin, Astronomy (M)  

182 Poster #42  9:00-10:45 am  
*Full Elasticity in Local Singular Arithmetical Congruence Monoids*  
Cody Allen, Mathematics (M)  

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**Session A-19**  
**Poster:**  
*Research in Psychology*  
Friday, March 8, 2013, 9:00 am – 10:45 am  
Location: Library Dome  

183 Poster #43  9:00-10:45 am  
*Depression as a Mediator for the Relationship Between Child Abuse and Dating Violence*  
Olga Villanueva, Psychology (U)  

184 Poster #44  9:00-10:45 am  
*Post traumatic Growth In Relation to Interpersonal Violence: A Review*  
Monica Guzman, Psychology (M)  

185 Poster #45  9:00-10:45 am  
*Child Abuse and Disordered Eating Behaviors: Does Dating Violence Moderate This Relationship?*  
Marissa Salazar, Psychology (M)
<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td><strong>Oral Presentation:</strong> Research in Molecular Medicine</td>
<td>Julia Jaroslawski, Nursing (U)</td>
</tr>
<tr>
<td>9:15 am</td>
<td>Effect of Vitamin D Administration on Cerebellar Purkinje Cells Following Developmental Alcohol Exposure</td>
<td>Phillip Silva, Cell Biology (U)</td>
</tr>
<tr>
<td>9:30 am</td>
<td>Pancreatic Beta Cells: The interdependence of intracellular calcium and insulin release</td>
<td>Perla Vega, Mathematics (U)</td>
</tr>
<tr>
<td>9:45 am</td>
<td>Using microfluidics chambers (Mother Machines) to observe individual cell physiology</td>
<td>DaKandryia Peters, Biology (U)</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Statins Promote Cardioprotection via Induction of Mitochondrial Autophagy</td>
<td>Genaro Hernandez, Biology (U)</td>
</tr>
<tr>
<td>10:15 am</td>
<td>Using stable isotopes in a dietary study of rattlesnakes</td>
<td>Darren Fraser, Biology (U)</td>
</tr>
<tr>
<td>10:30 am</td>
<td>Lower Cytotoxic Immune Responses Contribute to Racial Disparities in Colorectal Cancer</td>
<td>Jinel Shah, CMB (M)</td>
</tr>
<tr>
<td>10:45 am</td>
<td>The interaction of bacteriophage with the human mucosal immune system</td>
<td>Natasha Talago, Microbiology (M)</td>
</tr>
</tbody>
</table>

**Session B-2**

**Oral Presentation:** Identity and the Self
Friday, March 8, 2013, 11:00 am
Location: Love Library 430

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 am</td>
<td>Coming to Our Senses: The Dominant Eye, The Enslaved Ear, and the Struggle for Salvation</td>
<td>Anders Larsson, MALAS (M)</td>
</tr>
<tr>
<td>11:15 am</td>
<td>The Independence of Alternate Personas</td>
<td>Sam Zahn, Philosophy (M)</td>
</tr>
<tr>
<td>11:30 am</td>
<td>Linguistic variation to index one’s identity</td>
<td>Nicole Siminski, Applied Linguistics (M)</td>
</tr>
</tbody>
</table>

**Session B-3**

**Oral Presentation:** Latin American History and Anthropology
Friday, March 8, 2013, 11:00 am
Location: Love Library 431

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 am</td>
<td>PriceSmart Familiares y Amigos Program Feasibility Study</td>
<td>Elysha Decker, MBA General (M)</td>
</tr>
<tr>
<td>11:15 am</td>
<td>Mexihcatlahcuilolli (Mexica(n)/Nahuatl Writing System)</td>
<td>Miguel Nunez, Latin American Studies (M)</td>
</tr>
<tr>
<td>11:30 am</td>
<td>Racial Ambivalence Toward Mulattoes in Positivist Honduras, 1860–1887</td>
<td>Shayla Jacobs, LAS (M)</td>
</tr>
<tr>
<td>11:45 am</td>
<td>Power Dynamics along Borders: U.S. Media Depictions of Women Maquiladora Workers and Mexico</td>
<td>Rhianna Maras, Women Studies (M)</td>
</tr>
<tr>
<td>12:00 pm</td>
<td>The Endangered Nahualt Language of the Low Mountain Region of Guerrero, Mexico</td>
<td>Velma Calvario, Anthropology (M)</td>
</tr>
</tbody>
</table>
Session B-4

**Oral Presentation:** Undergraduate Research in Psychological Science

**Friday, March 8, 2013, 11:00 am**

**Location:** Love Library 410

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**202 12:15 pm**

*Exploring A New Era of Corporate Involvement in Latin American Education*

Charles Whitney, Anthropology (M)

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**Session B-5**

**Oral Presentation:** Graduate Research in Behavioral Science

**Friday, March 8, 2013, 11:00 am**

**Location:** Love Library 260

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**209 11:00 am**

*Conservatism, Perceived Threat, and Causal Attributions of Sexual Orientation*

Stacy Teeters, Psychology (M)

**210 11:15 am**

*What the Voice Tells Us: A Prosodic Analysis of Individual Political Expression*

Reed Reynolds, Communication Studies (M)

**211 11:30 am**

*The Combinatory Influence of Culture, Social Support, and Nature Experience on Adolescent Alcohol Use*

Daniel Badal, Psychology (M)

**212 11:45 am**

*Sending Signals: Does Experience Increase the Efficacy of Anti-snake Behaviors in Ground Squirrels?*

Breanna Putman, Ecology (D)

**213 12:00 pm**

*SES and Language Exposure Effects in Early Vocabulary Comprehension*

Stephanie De Anda, Language and Communicative Disorders (D)

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**Session B-6**

**Oral Presentation:** Undergraduate Research in Behavioral Science

**Friday, March 8, 2013, 11:00 am**

**Location:** Love Library 261

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**214 11:00 am**

*Literature Review: the associations between Latino cultural values and IPV*

Marisela Alamillo, Psychology (U)

**215 11:15 am**

*Hanging on to Home: Psychological Distress Among Brazilian, Dominican, and Mexican Migrants Residing in the United States*

Christian Rodriguez, Psychology (U)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Oral Presentation/Poster:</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11:30 am | 216     | Oral Presentation: Latina Health I | Social Capital, Health Insurance Coverage and Migrant Psychological Distress  
Yazmin Canul, Psychology (U) |
| 11:30 am | 223     | Oral Presentation: Popular Music in History | Revived On Broadway: Examining the Musicals  
Roxane Carrasco-Wood, MFA Musical Theatre (M) |
| 11:45 am | 224     | Oral Presentation: Music Identity and Memory | Evolution of the Role of Dance Captain in Musical Theatre Productions  
Jill Gorrie, Musical Theatre (M) |
| 11:00 am | 218     | Oral Presentation: Latina Health I | Health Literacy and Cancer Worry Among English- and Spanish-Speaking Hispanic Americans  
Cecilia Bess, Psychology (U) |
| 11:00 am | 225     | Oral Presentation: Popular Music in History | Gender Rebellion in Rock: Examining Courtney Love and Liz Phair as Maxims of Third Wave Feminism.  
Linnea Zeiner, History (U) |
| 11:15 am | 219     | Oral Presentation: Latina Health I | A multidisciplinary approach to the prevention of psychiatric disorders in adolescents with developmental disabilities: A case study of adolescents in Costa Rica  
Larissa Kreta, Psychology (U) |
| 11:15 am | 226     | Oral Presentation: Popular Music in History | Gender Discrimination: Women in Rock Music  
Sherry Boulter, History (U) |
| 11:30 am | 220     | Oral Presentation: Latina Health I | Possible Selves, Concepts of Barriers, Enculturation, and Substance Use Among Latino Adolescents  
Joanna Segoviano, Psychology (U) |
| 11:30 am | 227     | Oral Presentation: Popular Music in History | The Early Female Cultural Identity in Hip-Hop, 1975-1995  
Etienne Andrade, History (U) |
| 11:45 am | 221     | Oral Presentation: Latina Health I | What if Dante had an 808?: Tupac and Humanism’s Dolce Stil Novo  
Holly Puccino, MALAS (M) |

Session B-8

**Oral Presentation:** Music Identity and Memory  
Friday, March 8, 2013, 11:00 am  
Location: Library Addition 78

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Oral Presentation: Music Identity and Memory</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11:00 am | 221     | Playing Musical Theatre Roles Made Famous on Film: An Intimidated Actor Prepares  
Kimberly Burns, MFA in Musical Theatre (M) |
| 11:15 am | 222     | A British “National Experience”: William Alwyn’s Music for The Crown of the Year During the Second World War  
Breena Loraine, Musicology (M) |

Session B-12

**Poster:** Microbiology II  
Friday, March 8, 2013, 11:00 am – 12:45 pm  
Location: Library Dome

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Poster</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11 am-12:45 pm | 229   | Poster #1 | Coxsackievirus Infection of Neural Stem and Progenitor Cells, Alterations in Stem Cell Function, and Accelerated Disease Progression in a Mouse Model of Alzheimer's Disease  
Alicia Zamudio Montes de Oc, Biology/Psychology (U) |
230 Poster #2 11:00 am-12:45 pm
Previous Coxsackievirus Infection Restricted T cell
Migration into the Central Nervous System and
Reduced Signs of Disease in a Mouse Model of
Multiple Sclerosis
Laura McIntyre, Microbiology (U)

231 Poster #3 11:00 am-12:45 pm
The Role of MicroRNAs in Human Embryonic
Stem Cell Survival
Cullen Pivaroff, Biology (U)

232 Poster #4 11:00 am-12:45 pm
Reengineering the Zinc Finger Recombinase
Architecture for Future Stem Cell Therapies
and Research
Ryan Tingle, CMB (U)

233 Poster #5 11:00 am-12:45 pm
Genetic Barcoding for High Throughput Capabilities in
Mammalian Cells
Yen Lam, Biology (U)

234 Poster #6 11:00 am-12:45 pm
Crystal Structure Based Library of new Small
Molecules Active against the Hepatitis C Virus (HCV)
Amanda Siracusa, Biochemistry (U)

238 Poster #10 11:00 am-12:45 pm
Effects of Cultural Knowledge on Parallel Language
Activation in German-English Bilinguals
Sebnem Uzuner, Psychology (U)

239 Poster #11 11:00 am-12:45 pm
Odor Identification in Normal Older Adults: the
Influence of Statin Use
Catherine Sumida, Psychology (U)

240 Poster #12 11:00 am-12:45 pm
A Comparison of Two Paradigms to Assess Spatial
Pattern Separation
Dianna Welsh, Psychology (U)

Session B-13
Poster: Undergraduate Research in Brain Science
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

235 Poster #7 11:00 am-12:45 pm
Inactivation of the interoceptive insula suppresses
chemosensory cue reactivity to ethanol following
chronic ethanol exposure
Carlo Quintanilla, Psychology (U)

236 Poster #8 11:00 am-12:45 pm
Exploration of Source Memory in Parkinson’s
Disease Patients
Savanna Tierney, Psychology (U)

237 Poster #9 11:00 am-12:45 pm
Gender Difference in Targeting Performance can be
Eliminated by Reducing Conscious Analysis of Ball
Movement
Callie Warren, Psychology (U)

241 Poster #13 11 am-12:45 pm
MRI Diffusion Tensor-based White Matter Tractography
Analysis of Major Association Tracts Following Early
Brain Injury
Raymond Covarrubias, Psychology (M)

242 Poster #14 11 am-12:45 pm
Remote odor memory in genetically at risk ApoE ε3/4
and ε4/4 individuals with Alzheimer’s Disease
Stephanie Oleson, Psychology (M)

243 Poster #15 11 am-12:45 pm
Examining the Relationship Between Subjective Smell
Loss Ratings and Olfactory Test Performance
in Traumatic Brain Injury (TBI) Patients Pursuing
Injury Litigation
Elissa McIntosh, Psychology (M)

244 Poster #16 11 am-12:45 pm
An Assessment of Visuospatial Memory in Premanifest
and Manifest Huntington’s Disease
Dillon Challener, Psychology (M)

245 Poster #17 11 am-12:45 pm
I Wonder What’s in the Mystery Box: Cognitive and
Social Behaviors in Individuals with Williams Syndrome
Philip Lai, Language & Communicative Disorders (D)

246 Poster #18 11 am-12:45 pm
OERP scalp topography as a function of age and
Apolipoprotein E ε4 during encoding of olfactory
information.
Lisa Graves, Psychology (M)
Session B-15
**Poster:** Aerospace Structures
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

247 Poster #19 11 am-12:45 pm
*Origami inspired Design of Stiffened Shell Structures for Aerospace Applications*
Francisco Candido, Aerospace Engineering (U)

248 Poster #20 11 am-12:45 pm
*Experimental Investigation of Tapered Edge Closeouts in Sandwich Composite Panels*
Scott James, Aerospace (U)

249 Poster #21 11 am-12:45 pm
*Experimental Investigation of Densified Honeycomb Cores at Tapered Sandwich Laminate Closeouts*
Andrew Christensen, Aerospace (U)

250 Poster #22 11 am-12:45 pm
*Numerical Homogenization of Crushed Honey Comb Cores*
Elizabeth Fortin, Mechanical Engineering (U)

251 Poster #23 11 am-12:45 pm
*Experimental Validation of Inplane Crushing of Honeycomb Cores for Producing Functionally Graded Core Materials*
Brett Sens, Aerospace Engineering (U)

Session B-16
**Poster:** Energy
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

252 Poster #24 11 am-12:45 pm
*Analysis of campus buildings from an energy conservation standpoint*
Paulo Souza, Mechanical Engineering (U)

253 Poster #25 11 am-12:45 pm
*Internal building systems and their impact on energy conservation*
Aaron Nickovich, Mechanical Engineering (U)

254 Poster #26 11 am-12:45 pm
*Biogas Production of Anaerobic Digesters*
Carol Stein, Civil Engineering (U)

255 Poster #27 11 am-12:45 pm
*Carbon Particle Generation and Small Particle Heat Exchange Receiver Lab Scale Testing*
Lee Frederickson, Mechanical Engineering (M)

256 Poster #28 11 am-12:45 pm
*Power Optimization and Control in Wind Energy Conversion Systems using Extremum Seeking*
Azad Ghaffari, JDP (D)

257 Poster #29 11 am-12:45 pm
*The Morphing Turbine Blade for Wind Energy Conversion*
David MacPhee, Mechanical Engineering (D)

Session B-17
**Poster:**
Materials, Reactions, and Supersonic Flow Modeling
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

258 Poster #30 11 am-12:45 pm
*Reactive Spin Casting of NiTi*
Derek Sacco, MSME (M)

259 Poster #31 11 am-12:45 pm
*Kinetics of Interparticle Contact Growth during Consolidation of Vanadium Carbide Powders*
Diletta Giuntini, Mechanical Engineering (D)

260 Poster #32 11 am-12:45 pm
*Experimentation and Constitutive Modeling for Spark Plasma Sintering of Copper*
Wei Li, Mechanical and Aerospace Engineering (D)

261 Poster #33 11 am-12:45 pm
*Processing of Zirconium Carbide Annular Shape Pellets by Spark Plasma Sintering*
Xialu Wei, Mechanical Engineering (D)

262 Poster #34 11 am-12:45 pm
*Chemical kinetic study of extinction and autoignition of toluene flames*
Vaishali Amin, Engineering Sciences (D)

263 Poster #35 11 am-12:45 pm
*Cloud Dispersion in Particle-Laden Flow*
Sean Davis, Aerospace (D)
### Session B-18
**Poster:** Chemistry II  
**Friday, March 8, 2013, 11:00 am – 12:45 pm**  
**Location:** Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>264</td>
<td>11 am-12:45 pm</td>
<td>Borate Binding to the Periplasmic Iron Transport Protein FbpA in a Marine Bacterium</td>
<td>Jerrell Tisnado, Biochemistry (U)</td>
</tr>
<tr>
<td>265</td>
<td>11 am-12:45 pm</td>
<td>Micromide: A Cytotoxic Alkaloid Undergoing Shifts in Stereochemistry and Primary Structure</td>
<td>Natalia Kettoola, Biochemistry (U)</td>
</tr>
<tr>
<td>266</td>
<td>11 am-12:45 pm</td>
<td>Computational Docking Studies of Tetrahydroneopterin and Pteridines to Phenylalanine Hydroxylase</td>
<td>Victoria Nguyen, Chemistry, emphasis in Biochemistry (U)</td>
</tr>
<tr>
<td>267</td>
<td>11 am-12:45 pm</td>
<td>Synthesis and study of novel protic carbene catalysts for transforming glycerine into other chemicals</td>
<td>Khoi Le, Chemistry (U)</td>
</tr>
<tr>
<td>268</td>
<td>11 am-12:45 pm</td>
<td>Using cyclic voltammetry to study the biological reactivity of 1-methyl-5-nitroimidazole with various acids in DMSO</td>
<td>Eqlema Roshnaye, Chemistry (U)</td>
</tr>
<tr>
<td>269</td>
<td>11 am-12:45 pm</td>
<td>Voltammetry of 2-nitroimidazole</td>
<td>Samvel Avagyan, Biology (U)</td>
</tr>
<tr>
<td>270</td>
<td>11 am-12:45 pm</td>
<td>Signaling protein Sts-1 contains a novel phosphotyrosine binding domain and down-regulates NGF receptor-mediated tyrosine phosphorylation</td>
<td>Spencer Swarts, Chemistry and Biochemistry (D)</td>
</tr>
</tbody>
</table>

### Session B-19
**Poster:** Materials, Reactions, and Supersonic Flow Modeling  
**Friday, March 8, 2013, 11:00 am – 12:45 pm**  
**Location:** Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>271</td>
<td>11 am-12:45 pm</td>
<td>Exploration and suppression of tau-induced cardiac and skeletal muscle defects in a Drosophila model</td>
<td>Adriana Trujillo, Biology (M)</td>
</tr>
</tbody>
</table>

### Session C-1
**Oral Presentation:** Ecological Science  
**Friday, March 8, 2013, 1:00 pm**  
**Location:** Library Addition 2203

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 pm</td>
<td>Antibiotic resistance of Pseudomonas putida to ciprofloxacin (CIP) at environmentally relevant concentrations</td>
<td>Mark Rein, Environmental Engineering (U)</td>
</tr>
<tr>
<td>1:15 pm</td>
<td>Rattlesnake Encounters Alter Vigilance Behavior of California Ground Squirrels (Spermophilus beecheyi)</td>
<td>Rey Ayon, Biology (U)</td>
</tr>
<tr>
<td>1:30 pm</td>
<td>Identifying the Causes and Consequences of Larval Growth and Survival in grass rockfish (Sebastes rastrelliger)</td>
<td>Claire Andrews, Biology (U)</td>
</tr>
<tr>
<td>1:45 pm</td>
<td>Eelgrass Habitat Loss and Biodiversity: Structural Complexity Modifies Effects of Disturbance on Epifauna</td>
<td>Alterra Sanchez, Biology (U)</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Characterization of Extremophiles from National Parks using the 16S gene</td>
<td>Harmony Saunders, Biology (U)</td>
</tr>
</tbody>
</table>
281 2:15 pm
It’s a little bit fishy: Standardized diet compositions for phocid seals
Meghan Smallcomb, Marine Biology (U)

282 2:30 pm
The Patterns in the Plates: An Investigation of Baleen Ultrastructure in the Fin Whale (Balaenoptera physalus)
Nicholas Zellmer, Biology (M)

Session C-2
Oral Presentation:
World History and Sustainable Development
Friday, March 8, 2013, 1:00 pm
Location: Love Library 430

283 1:00 pm
Women in Early Islam
Monique Martinez, History (U)

284 1:15 pm
The Discourse of Sustainable Development
Ariel Rawson, Interdisciplinary Studies (U)

285 1:30 pm
Aishah Bint Abi Bakr and the Battle of the Camel: Evolving Islamic Conservatism’s Effect on the Presentation of Her Legacy
Mary Clipper, History (U)

286 1:45 pm
The Making of the “Fall” of Rome: The Transformation of the (His)tography
Javier Gonzalez-Meeks, History (M)

287 2:00 pm
Assessing disaster recovery in an ethnic minority community of the Western Solomon Islands
Savanna Schuermann, Anthropology (M)

288 2:15 pm
Kurt Schumacher, Rearmament, and the Opposition
Schorsch Kaffenberger, History (M)

Session C-3
Oral Presentation: Technology, Self, and Society
Friday, March 8, 2013, 1:00 pm
Location: Love Library 431

289 1:00 pm
Exploring the Effectiveness of Advertising Disclaimers on Digitally Enhanced Images
Steven Shyne, Marketing (U)

290 1:15 pm
Computers, Can They Think Like Humans?
Phillip Kim, Philosophy (U)

291 1:30 pm
Accessibility to Information Toward Self Expansion Through Conversational Dynamics and Positive Orientation for the Public’s Enlightenment
Nicholas Passanisi, Kinesiology (U)

292 1:45 pm
iExpose: A critical look at our use of smart-phones and tablets
Allison Schulz, Liberal Arts & Sciences (M)

293 2:00 pm
The Face of New Feminism: Accessibility and the Rise of the Digital Age
Jennifer Carter, Liberal Arts and Sciences (M)

294 2:15 pm
How Prior Relationships can be used to Predict Cyber-Tactics in Online Stalking Cases
Russell Holm, Communication (M)

295 2:30 pm
Love Online: A Study of Long-Distance Romantic Relationships and the Use of Video Chat to Engage in Sexual Behavior
Anthony Johnson, Communication (M)

Session C-4
Oral Presentation: Work, Families, and Policy
Friday, March 8, 2013, 1:00 pm
Location: Love Library 410

296 1:00 pm
Fathers’ Effects on African-American Male Educational Utility
Terence Ellis, Psychology (U)
297 1:15 pm  
*Long-term Structural Changes to Familial Ties Due to Emigration*  
Jose Huizar, Anthropology (M)

298 1:30 pm  
*The Flexible Family*  
Damien Sutton, Women’s Studies (M)

299 1:45 pm  
*Role Blurring and Work-Life Conflict: The Effects of Work and Non-Work Demands and Resources*  
Renee Payne, Applied Psychology (M)

300 2:00 pm  
*A little piece of home*: Geographies of the Home Front on the Frontline  
Denise Goerisch, Geography (D)

Session C-5  
**Oral Presentation:**  
Graduate Research in Psychology  
Friday, March 8, 2013, 1:00 pm  
Location: Love Library 260

301 1:00 pm  
*Classification of Autism Brain Imaging Data Using Machine Learning Algorithm*  
Colleen Chen, Computational Science (M)

302 1:15 pm  
*Visual Object Pattern Separation Deficits Vary in Cognitively Normal Older Adults*  
David Sheppard, Psychology (M)

303 1:30 pm  
*Evidence In Men and Women for a Differential Role for Embodied Cognition of Ball Movement in a Targeting Task*  
Michelle Louden, Psychology (M)

304 1:45 pm  
*Time Course of Inhibition Difficulties in Anxiety*  
Joseph Boffa, Clinical Psychology (M)

Session C-6  
**Oral Presentation:** Under and Above Ground Research in Dynamic Communities  
Friday, March 8, 2013, 1:00 pm  
Location: Love Library 260

305 1:00 pm  
*44th Street Community Wrap Around Mobilization: Creating safe neighborhoods and changing systems*  
Devin Grindrod, Psychology (U)

306 1:15 pm  
*The Urban Campground: A Critical Study of the Homeless Tent Community*  
Gentry Cole, Communication (U)

307 1:30 pm  
*Cultural interactions and integration: The influence of ethnic markets in suburban neighborhoods.*  
Michael Cash, International Business (U)

308 1:45 pm  
*Sustainable Development and Residents’ Satisfaction Levels with the Quality of life: A comparison between Ecuador and The United States*  
Amanda Cosolito, Interior Design (U)

309 2:00 pm  
*Encouraging Community Sustainability: Creating the Second Person Effect to Influence Social Responsibility through Emotional Appeals in Film*  
Fernando Beltran, Journalism and Media Studies (U)

Session C-7  
**Oral Presentation:** Health, Food, and Eating  
Friday, March 8, 2013, 1:00 pm  
Location: Library Addition 76

310 1:00 pm  
*What is holistic health? Perspectives from Alternative School Parents*  
Samuel Spevack, Anthropology (U)

311 1:15 pm  
*The Relationship between Body Image and Disordered Eating in College Students Studying Foods and Nutrition*  
Carly Schott, Foods and Nutrition (U)
312 1:30 pm  
**Narratives That Integrate: Communicating Philosophies, Practices, and Identities in 21st Century Medicine**  
Brielle Plump, Communication (M)

313 1:45 pm  
**Environmental Justice and Alternative Food Movements—Complicating the discourse about consumerism.**  
Kari Szakal, Women’s Studies (M)

Session C-8  
**Oral Presentation:** Education and Identity  
Friday, March 8, 2013, 1:00 pm  
Location: Library Addition 78

314 1:00 pm  
**The combination of collaborative play therapy, solution-focused art therapy, and narrative art therapy improves academic performance and in-school and at-home behavior of elementary school children**  
Ralf Schuster, Psychology (U)

315 1:15 pm  
**The effectiveness of a skill-building curriculum, Families OverComing Under Stress (FOCUS), with school-age children from military families in San Diego**  
Susana Flores, School Psychology (M)

316 1:30 pm  
**Bilingualism and Teaching Practices**  
Soujanya Gade, Child & Family Development (M)

317 1:45 pm  
**Applying Social Orientation Theory in the Communicative ESOL Classroom**  
Amanda Opperman, Education (D)

Session C-9  
**Oral Presentation:** Analytical and Physical Chemistry  
Friday, March 8, 2013, 1:00 pm  
Location: Love Library 408

318 1:00 pm  
**Controlled Derivitization of PDMS for use in Electrophoretic Separations**  
Dylan Mitchell, Biochemistry (U)

319 1:15 pm  
**Application to Organic Synthesis: Simple Regioselectivity Determination in Hydroboration of 9-BBN**  
Brittany Barfield, Chemistry (U)

320 1:30 pm  
**Observation of Stimulated Emission Near 5 μm in a Liquid Nitrogen-Cooled Plasma**  
Michael Baude, Chemical Physics (U)

321 1:45 pm  
**The Mechanisms of Hydrogen Bonding and Proton-Coupled Electron Transfer of Substituted N-(4-(dimethylamino)phenyl)-N-phenylureas in Different Non-Aqueous Solvent/Supporting Electrolyte Environments**  
Laurie Clare, Chemistry (M)

322 2:00 pm  
**Electroosmotic flow studies of onium based compounds by using capillary rinses and altering buffering ions**  
Ashley Morris, Chemistry (M)

323 2:15 pm  
**The characterization of phosphorous acid as a coating for zirconia columns in HPLC**  
Stephanie Archibald, Chemistry (M)

324 2:30 pm  
**Relocalization Dynamics of the HC₃O Free Radical by Finite Element Method Vibrational Analysis**  
Peter Zajac, Computational Chemistry (D)

Session C-10  
**Oral Presentation:** Environmental Monitoring  
Friday, March 8, 2013, 1:00 pm  
Location: Love Library 408

325 1:00 pm  
**Addressing Confounding Occurrence of Errors With the Dylos Air Quality Monitor**  
Calvin Wong, Public Health (U)

326 1:15 pm  
**Mapping and Monitoring: The Water Distribution System in Balboa Park**  
John Moran, Environmental Sciences (U)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 pm</td>
<td><em>Methods and Data: Trace Gas and Water Vapor Sampling</em></td>
<td>Jared Marsh, Environmental Sciences (U)</td>
</tr>
<tr>
<td>1:45 pm</td>
<td><em>Recycled Groundwater Development at Harmony Grove, San Diego County, CA</em></td>
<td>Cheryl Johnson, Geological Sciences (M)</td>
</tr>
<tr>
<td>2:00 pm</td>
<td><em>The influence of ammonium and Suwannee River humic acid on the dissolution and toxicity of silver nanoparticles to Nitrosomonas europaea</em></td>
<td>Cameron Kostigen Mumper, Environmental Sciences (M)</td>
</tr>
<tr>
<td>2:15 pm</td>
<td><em>Sensitive Laser Spectroscopic Studies of Chemical and Biological Agents for Biomedical and Security Applications</em></td>
<td>Marcel Hetu, Chemistry (D)</td>
</tr>
<tr>
<td>1:00 pm-2:45 pm</td>
<td><strong>Poster: Psychology and Public Health</strong></td>
<td><strong>Session C-12</strong></td>
</tr>
<tr>
<td>331</td>
<td>Poster #1 1:00 pm-2:45 pm <em>Challenges, stressors, and coping mechanisms in Mexican-American women</em></td>
<td>Joanna Sarifiana, Psychology (U)</td>
</tr>
<tr>
<td>332</td>
<td>Poster #2 1:00 pm-2:45 pm <em>The Influence of Gender, Age and Income on Children's Chores</em></td>
<td>Lindsay McCampbell, Psychology (U)</td>
</tr>
<tr>
<td>333</td>
<td>Poster #3 1:00 pm-2:45 pm <em>How Parental Barriers to Accessing a Usual Source of Care Affect Children's Preventive Health Service Use</em></td>
<td>John Bellettiere, Health Promotion and Behavioral Science (M)</td>
</tr>
<tr>
<td>334</td>
<td>Poster #4 1:00 pm-2:45 pm <em>Family Perspectives of a Parent-Implemented Blended Intervention Approach for Young Children At-Risk for ASD</em></td>
<td>Julia Trigeiro, Public Health (M)</td>
</tr>
<tr>
<td>1:00 pm-2:45 pm</td>
<td><strong>Poster: Urban and Environmental Research</strong></td>
<td><strong>Session C-13</strong></td>
</tr>
<tr>
<td>335</td>
<td>Poster #5 1:00 pm-2:45 pm <em>Hacienda Escudero</em></td>
<td>John Luu, Environmental Science (U)</td>
</tr>
<tr>
<td>336</td>
<td>Poster #6 1:00 pm-2:45 pm <em>Sustainable human development through affordable housing: A comparison of traditional vs. mixed income housing models</em></td>
<td>Elena Shulman, Urban Studies (U)</td>
</tr>
<tr>
<td>337</td>
<td>Poster #7 1:00 pm-2:45 pm <em>Cultivating Communities: The Symbiotic Connection Between People and Urban Gardening</em></td>
<td>Christian Zaragoza, Urban Studies/Environmental Studies (U)</td>
</tr>
<tr>
<td>338</td>
<td>Poster #8 1:00 pm-2:45 pm <em>Incorporating Children's Attitudes and Participation Preferences Within Design Considerations for Successful School Garden Programs</em></td>
<td>Yvonne Parsons, Recreation and Tourism Management (U)</td>
</tr>
<tr>
<td>339</td>
<td>Poster #9 1:00 pm-2:45 pm <em>Reforming the California Environmental Quality Act Process</em></td>
<td>Jenny Wiseman, Environmental Science (U)</td>
</tr>
<tr>
<td>340</td>
<td>Poster #10 1:00 pm-2:45 pm <em>A Literature Review of Philippine Conservation Strategies</em></td>
<td>Sean Tangco, Anthropology (M)</td>
</tr>
<tr>
<td>1:00 pm-2:45 pm</td>
<td><strong>Poster: Clinical Psychology</strong></td>
<td><strong>Session C-14</strong></td>
</tr>
<tr>
<td>341</td>
<td>Poster #11 1:00 pm-2:45 pm <em>Design Fluency, Word Recall, and Odor Identification in a High Anxious Sample</em></td>
<td>Neil Yetz, Psychology (U)</td>
</tr>
<tr>
<td>342</td>
<td>Poster #12 1:00 pm-2:45 pm <em>Multi-Dimensional Dehumanization of Mental Illnesses</em></td>
<td>Michael McGlenn, Psychology (U)</td>
</tr>
</tbody>
</table>
**Poster #13** 1:00 pm-2:45 pm  
*The effects of anxiety and cognitive load on attention control*  
Kristen Frosio, Psychology (U)

**Poster #14** 1:00 pm-2:45 pm  
*Exploring Ethnic Match, Acculturation Match, and Parental Acculturation as Correlates of Parental Agreement with Therapists on Biopsychosocial Causes of Child Problems*  
Duyen Trang, Psychology (U)

**Poster #15** 1:00 pm-2:45 pm  
*Exploring the relationship between symptomatology and parent agreement with therapists about the causes of child problems*  
Jessica Holliday, Psychology (M)

**Session C-15**  
**Poster:** Bioengineering  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

**Poster #16** 1:00 pm-2:45 pm  
*Aortic Flow Dynamics in LVAD-supported Patient and a Novel Valve Prosthesis*  
Irwin Ling, Bioengineering (M)

**Poster #17** 1:00 pm-2:45 pm  
*Clinical Study of the Ventricular Flow Field in LVAD patients*  
Vi Vu, Bioengineering (M)

**Poster #18** 1:00 pm-2:45 pm  
*Effect of Aortic Valve Leaflet Fusion and Stiffening on Geometric Opening Area (GOA): Implications for Calcific Aortic Stenosis*  
Reshmi Banerjee, Bioengineering (M)

**Poster #19** 1:00 pm-2:45 pm  
*Digitization of electrocardiogram prior to in-hospital cardiac arrest*  
Lu Wang, Bioengineering (M)

**Poster #20** 1:00 pm-2:45 pm  
*Flow Visualization of intraventricular vortex formation and stasis in the LVAD-assisted left heart*  
Kin Wong, Bioengineering (M)

**Session C-16**  
**Poster:** Cardiac Biology III  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

**Poster #21** 1:00 pm-2:45 pm  
*Rosiglitazone Causes Gene Expression Changes in the Neonatal Rat Cardiocyte*  
Carlos Brambila, Bioengineering (U)

**Poster #22** 1:00 pm-2:45 pm  
*MitoTimer: A Novel Fluorescent Tool for the Study of Mitochondrial Turnover*  
Julie LaRue, Biology (U)

**Poster #23** 1:00 pm-2:45 pm  
*Modeling of the Calcium Signal in an Adult Cardiomyocyte Sarcomere*  
Amanda Brambila, Biochemistry (U)

**Poster #24** 1:00 pm-2:45 pm  
*Compensatory Gene Expression in Neonatal Cardiocytes: Gene Silencing Techniques*  
Elesha Bartolotta, Microbiology (U)

**Poster #25** 1:00 pm-2:45 pm  
*Influence of Fibronectin on Cardiac Progenitor Cell-mediated Myocardial Regeneration*  
Mercedes Quintana, Biochemistry (U)

**Session C-17**  
**Poster:** Microbiology III  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

**Poster #26** 1:00 pm-2:45 pm  
*IL17 and Racial Disparities in Colon Cancer*  
Avan Hassan, Biology (U)

**Poster #27** 1:00 pm-2:45 pm  
*Characterization of Group B Streptococcal clinical isolates and bacterial determinants that mediate Blood-Brain Barrier disruption*  
Efren Reyes, Biology (U)

**Poster #28** 1:00 pm-2:45 pm  
*Identification of a Group B Streptococcal fibronectin binding protein that mediates invasion of the blood brain barrier*  
Czarinh Paco, Microbiology (U)
359 Poster #29  1:00 pm-2:45 pm  
An Assay for the Discovery of West Nile Virus Protease Inhibitors  
Intisar Khamo, Biology (U)

360 Poster #30  1:00 pm-2:45 pm  
Genes Associated with Copper Tolerance and Copper Homeostasis in Vibrios  
Megan Morris, Biology/Ecology (M)

361 Poster #31  1:00 pm-2:45 pm  
Identification of a novel coral virus with global distribution  
Steven Quistad, Cell and Molecular Biology (D)

362 Poster #32  1:00 pm-2:45 pm  
Biomass Based Phenomic Approach for Identification of Novel Viral Proteins  
Savannah Sanchez, Microbiology (M)

Session C-18  
Poster: Aging  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

363 Poster #33  1:00 pm-2:45 pm  
Affect of ApoE e4 Status on Odor vs. Visual Naming Tasks  
Kristyn Bojorquez, Psychology (M)

364 Poster #34  1:00 pm-2:45 pm  
Impulsiveness as a predictor of obesity in older adults  
Karalani Cross, Psychology (U)

365 Poster #35  1:00 pm-2:45 pm  
10 Year Fracture Risk and Related Preventative Behaviors in the Elderly Living Independently  
Daniele Koren, Nursing (U)

366 Poster #36  1:00 pm-2:45 pm  
Bone Health and Acculturation of Korean-American Women  
Hyeran Seo, Nursing (BSN) (U)

367 Poster #37  1:00 pm-2:45 pm  
The Role of Sex, Age, and the Dementia Rating Scale on Olfactory Performance in Pathologically Confirmed Lewy Body Dementia, Clinically Diagnosed Alzheimer's Disease and Healthy Controls.  
Patricia Cintora, Psychology (U)

368 Poster #38  1:00 pm-2:45 pm  
Temporal Order Memory Deficits in Huntington's Disease  
Diane Nicoll, Psychology (M)

Session C-19  
Poster: Education I  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

369 Poster #39  1:00 pm-2:45 pm  
Teachers in the Age of Prometheus  
Sean Armijo, MALAS (M)

370 Poster #40  1:00 pm-2:45 pm  
Prosocial Behaviors in Elementary-Grade Students  
Maria Mendoza, Liberal Studies (U)

371 Poster #41  1:00 pm-2:45 pm  
Leadership in a Mandarin Immersion Program: All Students Learning Multiple Languages as an Essential 21st Century Skill  
Brenna Kielty Battin, Educational Leadership (D)

372 Poster #42  1:00 pm-2:45 pm  
Effectiveness of Repeated Reading and Word Decoding for a Latino English Language Learner: A Single Case Design  
Evelyn Ontiveros, School Psychology (M)

373 Poster #43  1:00 pm-2:45 pm  
Effectiveness of Self-Monitoring Intervention for Student with ADHD: A Single Case Design  
Kieu Tang, School Psychology (M)

374 Poster #44  1:00 pm-2:45 pm  
Using Action Research to Create A Model Library and Family Literacy Program at the SDSU Children's Center  
Chris Morris, Child and Family Development (U)

Session C-20  
Poster: Cancer Research  
Friday, March 8, 2013, 1:00 pm – 2:45 pm  
Location: Library Dome

375 Poster #45  1:00 pm-2:45 pm  
Survival Factors in Children with Central Nervous System Brain Tumors using the California Cancer Registry between 1988 and 2009  
Katrina Flores, Epidemiology (M)

376 Poster #46  1:00 pm-2:45 pm  
Early Detection of Ovarian Cancer Based on Sensitive Analysis of Biomarkers Using Nonlinear Laser Wave Mixing  
Sashary Ramos, Chemistry (U)
ORAL AND POSTER PRESENTATIONS

377  Poster #47  1:00 pm-2:45 pm
*Does Quality of Life among Cancer Survivors Differ by Socioeconomic Status?*
Elizabeth Medeiros, Public Health (U)

378  Poster #48  1:00 pm-2:45 pm
*Cognitions and Cancer Screening in Hispanic Americans*
Alexandria Booker, Psychology (U)

379  Poster #49  1:00 pm-2:45 pm
*Degenerate Four-Wave Mixing: An Ultrasensitive Laser Detection Method for Cancer Biomarkers*
Eric Maxwell, Chemistry (M)

Session D-1

**Oral Presentation:** US and US Ethnic History
Friday, March 8, 2013, 3:00 pm
Location: Library Addition 2203

380  3:00 pm
*Western Feminism vs Post-Colonial Feminism: Same Struggle or Different Worlds?*
Nikki Junker, History (U)

381  3:15 pm
*Children and Childhood Experiences Before and During the Japanese-American Incarceration Camps*
Brittany Daniloff, History (U)

382  3:30 pm
*True Causes of the 1992 Los Angeles Riots*
Shane Bailey, History (M)

383  3:45 pm
*Women Interrupted: Japanese American Women in the Poston War Relocation Center During World War II.*
Amber Tiffany, History (M)

384  4:00 pm
*Did slavery end in 1865? A review of the literature on Afro-pessimism*
D. Alexandra Hunt, Liberal Arts (M)

Session D-2

**Oral Presentation:**
Migrants: Social and Psychological Distress
Friday, March 8, 2013, 3:00 pm
Location: Love Library 410

386  3:00 pm
*Sex and Psychological Distress Among Three U.S. Migrant Groups in the USA*
Keith Lyons, Sociology (U)

387  3:15 pm
*Employer-sponsored Health Insurance, Medical Care and Migrant Psychological Distress.*
Kirsten Kessler, Sociology (U)

388  3:30 pm
*Deportation and Migrant Psychological Distress*
Jessica Monterrubio, Economics (U)

389  3:45 pm
*Marital Conflict, Civic Engagement and Distress among Brazilian, Dominican and Mexican Migrants*
Genesis Reyes, Nursing (U)

390  4:00 pm
*Remitting and Psychological Distress among Foreign-born Migrant Workers in Metropolitan Boston and Los Angeles*
Paige Leneski, Biology (U)

391  4:15 pm
*DREAMing Together: Partnership Strategies for Community Empowerment and Integration among Undocumented Students*
Olivia Quintanilla, Urban Studies (U)

Session D-3

**Oral Presentation:**
Computer Science Application in Biology
Friday, March 8, 2013, 3:00 pm
Location: Love Library 408

392  3:00 pm
*The database and interaction of VDM project*
Heqiao Liu, Computer Science (U)

393  3:15 pm
*FOCUS: A model to identify organisms present in metagenomes based on codon usage*
Genivaldo Silva, Computational Science (M)
394 3:30 pm
Plugin architecture for creating algorithms for bioacoustic signal processing software
Christopher Marsh, Computer Science (M)

395 3:45 pm
Determining Dolphin Species by their Echolocation Clicks: A Study of the Effects of Site Variability, Noise, and Recording Equipment Differences
Johanna Stinner-Sloan, Computer Science (M)

396 4:00 pm
The novel fold of a virion structural protein revealed by computational and crystallographic analysis of viral dark matter
Victor Seguritan, Computational Science (D)

397 4:15 pm
Feedback interaction network between the microRNA miR-124 and the Notch signaling pathway
Jerry Chen, Computational Science (D)

Session D-12
Poster: Speech, Language, and Hearing Sciences
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

398 Poster #1 3:00 pm-4:45 pm
Lateral Allophony in Early vs. Late Spanish-English Bilinguals
Danielle Torrez, Speech, Language, & Hearing Sciences (U)

399 Poster #2 3:00 pm-4:45 pm
Associative versus repetition priming in Aphasia
Jamie Brown, Speech, Language, & Hearing Sciences (U)

400 Poster #3 3:00 pm-4:45 pm
Language Proficiency Influences Lexical Competition in Monolinguals and Bilinguals
Michelle Ortega, Speech, Language, & Hearing Sciences (U)

401 Poster #4 3:00 pm-4:45 pm
Approaches to Child Language Assessment
Davonna Lowe, Speech, Language, & Hearing Sciences (U)

402 Poster #5 3:00 pm-4:45 pm
Voice Onset Time in Early vs. Late Spanish-English Bilinguals
Annelise Brumley, Speech, Language, & Hearing Sciences (U)

403 Poster #6 3:00 pm-4:45 pm
Attention and language in Children with Specific Language Impairment
Jennifer Kostlan, Speech, Language, & Hearing Sciences (M)

404 Poster #7 3:00 pm-4:45 pm
Detailing the Language Growth of Children from at-risk backgrounds
Sarah Hershkowitz, Speech Language Pathology (M)

Session D-13
Poster: Latina Health II
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

405 Poster #8 3:00 pm-4:45 pm
Factors Associated With Self-Care Practices And Healthcare Use in Latinos With Type 2 Diabetes
Elena Lenkova, Biology (U)

406 Poster #9 3:00 pm-4:45 pm
Positive experiences, strengths, and resources important to Mexican-American women’s life satisfaction
April San Roman, Psychology (U)

407 Poster #10 3:00 pm-4:45 pm
Perceived Environment, Safety and the Relationship between Walking Around a Neighborhood & Physical Activity among Churchgoing Latinas
Natalicio Serrano, Health Science (Public Health) (U)

408 Poster #11 3:00 pm-4:45 pm
Relationships between objectively measured physical activity and sleep duration and sleep quality among Latinos
Hena Din, Public Health (M)

409 Poster #12 3:00 pm-4:45 pm
Association Between Sleep Duration and Weight Status Among Hispanic Latina Women
Shaylyn Stark, MPH (M)

410 Poster #13 3:00 pm-4:45 pm
Structural and Functional Social Support and Diabetes Prevalence in US Latinos from the HCHS/SOL Sociocultural Ancillary Study
Jessica McCurley, Clinical Psychology (D)

411 Poster #14 3:00 pm-4:45 pm
The type and composition of social support for physical activity among Latinos
Wendy Serrano, Spanish (U)
### Session D-14
**Poster:** Ecology and Environmental Science  
**Friday, March 8, 2013, 3:00 pm – 4:45 pm**  
**Location:** Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
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</thead>
<tbody>
<tr>
<td>412</td>
<td>3:00 pm–4:45 pm</td>
<td>Predicting the Effects of Sea Level Rise on Three Sea Turtle Nesting Beaches in Costa Rica</td>
<td>Lizette Guzman, Biology (U)</td>
</tr>
<tr>
<td>413</td>
<td>3:00 pm–4:45 pm</td>
<td>Taxonomy of the winged popcorn flower: Cryptantha pterocarya (Boraginaceae)</td>
<td>Regina Dowdy, Biology (U)</td>
</tr>
<tr>
<td>414</td>
<td>3:00 pm–4:45 pm</td>
<td>Studying effects of land use change on water quality and flooding in an urban watershed</td>
<td>Patrick Murphy, Environmental Sciences (U)</td>
</tr>
<tr>
<td>415</td>
<td>3:00 pm–4:45 pm</td>
<td>Analytical method development of persistent organic pollutants using GC×GC/TOF-MS in desert tortoise plasma samples</td>
<td>Billionrosannae Chhouk, Environmental Sciences (U)</td>
</tr>
<tr>
<td>416</td>
<td>3:00 pm–4:45 pm</td>
<td>Urbanization and Stream Channel Erosion in San Diego County: The Use of Remote Sensing to Estimate Stream Channel Geometry</td>
<td>Kristine Taniguchi, Geography (M)</td>
</tr>
<tr>
<td>417</td>
<td>3:00 pm–4:45 pm</td>
<td>An investigation into the Anomalous Rising Groundwater Levels Beneath Kearny Mesa, California and Its Implications on Human Health Risk</td>
<td>Ronel Skoda, Environmental Science (U)</td>
</tr>
</tbody>
</table>

### Session D-15
**Poster:** Applied Psychology  
**Friday, March 8, 2013, 3:00 pm – 4:45 pm**  
**Location:** Library Dome

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<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
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</thead>
<tbody>
<tr>
<td>418</td>
<td>3:00 pm–4:45 pm</td>
<td>Muslims in the News: The Effects of Visual and Semantic Stimuli on Attitudes Toward Muslims</td>
<td>Jacob Brookfield, Psychology (U)</td>
</tr>
<tr>
<td>419</td>
<td>3:00 pm–4:45 pm</td>
<td>Investigation Teacher Wait Time in One-on-One Tutoring Sessions</td>
<td>Monique Lee, Psychology (U)</td>
</tr>
</tbody>
</table>

### Session D-16
**Poster:** Social Psychology  
**Friday, March 8, 2013, 3:00 pm – 4:45 pm**  
**Location:** Library Dome

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>420</td>
<td>3:00 pm–4:45 pm</td>
<td>A Cross-Cultural Comparison of Concepts of Possible Selves and Substance Use among Native American and Latino Adolescents</td>
<td>Lina Kern, Psychology (U)</td>
</tr>
<tr>
<td>421</td>
<td>3:00 pm–4:45 pm</td>
<td>Determining Factors Important in Influencing ASD Community Stakeholders Participation in an Academic-Community Collaboration</td>
<td>Emily Spurgeon, Psychology (U)</td>
</tr>
<tr>
<td>422</td>
<td>3:00 pm–4:45 pm</td>
<td>The Effects of Professionalism and Ethnicity on the Likelihood of Being Hired</td>
<td>Colleen Healy, Psychology (U)</td>
</tr>
<tr>
<td>423</td>
<td>3:00 pm–4:45 pm</td>
<td>Organizational socialization as a mediator of the relationship between employee proactive behavior and engagement</td>
<td>Elisa Torres, Industrial &amp; Organizational Psychology (M)</td>
</tr>
<tr>
<td>424</td>
<td>3:00 pm–4:45 pm</td>
<td>Roles of Women in Military Recruiting Posters</td>
<td>Sandra Kirkwood, Anthropology (M)</td>
</tr>
</tbody>
</table>

### Session D-17
**Poster:** Psychology  
**Friday, March 8, 2013, 3:00 pm – 4:45 pm**  
**Location:** Library Dome

<table>
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<tr>
<th>Poster #</th>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
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</thead>
<tbody>
<tr>
<td>425</td>
<td>3:00 pm–4:45 pm</td>
<td>Are Optimists Better or Worse at Reading Relationships? A Test of Two Hypotheses</td>
<td>Julia Bussberg, Psychology (U)</td>
</tr>
<tr>
<td>426</td>
<td>3:00 pm–4:45 pm</td>
<td>The Effect of Commuting Time, Personality Type, Gender and Age on Anxiety Levels</td>
<td>Mary Anne Olmedo, Psychology (U)</td>
</tr>
<tr>
<td>427</td>
<td>3:00 pm–4:45 pm</td>
<td>What Your Friendships Say About You: Having Interracial Friendship Networks May Boost Positive Social Perceptions</td>
<td>Michelle Manning, Psychology (U)</td>
</tr>
<tr>
<td>428</td>
<td>3:00 pm–4:45 pm</td>
<td>Enhancing Optimism with Cost-Benefit Analyses</td>
<td>Allison White, Psychology (U)</td>
</tr>
</tbody>
</table>
429 Poster #32  3:00 pm-4:45 pm
LGB friends reduces internal conflict with sexual minorities through controllability
Janelle Shaffer, Psychology (U)

Session D-17
Poster: Social Psychology
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

430 Poster #33  3:00 pm-4:45 pm
The effects of vitamin D on stress in a rat model of fetal alcohol spectrum disorders
Andy Ngo, Psychology (U)

431 Poster #34  3:00 pm-4:45 pm
Analysis of the Moderating Effects of Adolescent Drinking Behaviors on the association between Alcohol Outlet Density and Impulsivity: An Ecological Perspective
Jessica Cota, Social Work (M)

432 Poster #35  3:00 pm-4:45 pm
Choline as a Treatment for Fetal Alcohol Spectrum Disorders: Mechanisms of Choline's Actions
Rashmi Risbud, Psychology (M)

433 Poster #36  3:00 pm-4:45 pm
The Influence of Extrinsic Reinforcement on Executive Attention in Children with Prenatal Alcohol Exposure
Diana Graham, Psychology (M)

434 Poster #37  3:00 pm-4:45 pm
Testing the Invariance of Adolescent Survey-Based Smoking-Related Behaviors Across Ethnic Groups and Gender
Darius Dawson, Psychology (M)

Session D-18
Poster: Microbiology IV
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

435 Poster #38  3:00 pm-4:45 pm
Characterization of Intracellular Trafficking by Streptococcus agalactiae
Yvette Del Rosario, Microbiology (M)

436 Poster #39  3:00 pm-4:45 pm
Characterization of the Host Response to Helicobacter infection during progression to Gastric Cancer
Amika Sharma, Bioinformatics and Medical Informatics (M)

437 Poster #40  3:00 pm-4:45 pm
Presence of the Phage-Encoded Antibiotic Resistant Gene, blaCTX-M1, in Wastewater, River, and Estuarine Samples Collected near the US-Mexico Border
Marley Hilleger, Microbiology (U)

438 Poster #41  3:00 pm-4:45 pm
Validating artificial neural networks that predict bacteriophage holin proteins
Casey Cruz, Biology (U)

439 Poster #42  3:00 pm-4:45 pm
Examining double-strand break repair in vivo
Sean Young, Biology (U)

440 Poster #43  3:00 pm-4:45 pm
Elucidating the role of Hepatitis C Virus NS2 and NS4A cofactors on the activity of NS3 protease
Plamena Silvieva, Cell/Molecular Biology (M)

Session D-19
Poster: Microbial Ecology
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

441 Poster #44  3:00 pm-4:45 pm
High Variability and Low Site Specific Microbial Communities Occur on Black Tip Reef Sharks (Carcharinus melanopterus) in the Southern Line Islands
Michael Doane, Biology (M)

442 Poster #45  3:00 pm-4:45 pm
Sequencing and Annotating the California Sea Lion Genome
Sowmya Chinta, BMI (M)

443 Poster #46  3:00 pm-4:45 pm
Statistical Analysis of Metagenomes in Marine Environments
Horacio Lopez, Mathematics (U)

444 Poster #47  3:00 pm-4:45 pm
Biogeochemical and microbiological niche space of Hydra spp. in San Diego County
Mark Little, Biology (U)

445 Poster #48  3:00 pm-4:45 pm
Delineation of Core and Satellite Bacteria Associated with Coral and Algal Hosts
Eric Hester, Microbiology (U)
Sessions: Saturday, March 9, 2013

Session E-1

Oral Presentation: Education II
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 2203

446 9:00 am
Restorative Practices in the homes of Spanish speaking parents
Daniel Ramirez, Education (M)

447 9:15 am
Effects of Hair Combing Interaction Support Groups on Caregiver and Child Attachment
Kathleen Baca, Community Based Block (M)

448 9:30 am
Empowering Spanish Speaking Parents: A Workshop on Academic Home Involvement
Jessica Gutierrez, School Psychology (M)

449 9:45 am
Sexual Identity, Race and Resiliency Among College Students
Aaron Iffland, SDSU/CGU Joint Ph.D. in Education (D)

450 10:00 am
Restorative Practice in the Classroom
Derek Moehlenbruck, School Psychology (D)

451 10:15 am
A Comparison Study of the Professional Learning Communities in the United States and China
Ke Xu, Educational Leadership (D)

Session E-2

Oral Presentation: Public Health and Social Policies
Saturday, March 9, 2013, 9:00 am
Location: Love Library 430

452 9:00 am
Stressful Life Events, and Appraisal in Individuals at Clinical High-Risk for Psychosis, First-Episode Schizophrenia and Healthy Controls
Edward Lannon, Psychology (U)

453 9:15 am
Exercise and Nutrition Knowledge in Deaf Individuals
Laura Greathouse, Psychology (U)

454 9:30 am
SB 183: Carbon Monoxide Prevention Act Research Project
Victoria Carrillo, Criminal Justice Administration (U)

455 9:45 am
From Dutch to Russian Disease
Anna Ossowska-Borowik, Economics (U)

456 10:00 am
The Global Relationship between Maternal Mortality and Births Overseen by Skilled Health Workers
Raphael Cuomo, Public Health (M)

Session E-3

Oral Presentation: Speech and Language
Saturday, March 9, 2013, 9:00 am
Location: Love Library 431

457 9:00 am
Descriptions of Trajectories in Space Using English Verbs of Motion: A Study of English-Spanish Bilingual Children with Specific Language Impairment
Kali Markle, Speech Language Pathology (U)

458 9:15 am
The Eye and the Hand: Visual-Haptic Interaction in Word Comprehension
Samantha Mitsven, Psychology (U)

459 9:30 am
The Auditory Comprehension of Who and Which-NP Questions: Which Account do the Data Support?
Shannon MacKenzie, Language and Communicative Disorders (D)

460 9:45 am
You can look but don’t touch: the real-time dynamics between infant visual and haptic behavior
Kristi Hendrickson, Speech, Language, and Hearing Sciences (D)

461 10:00 am
Cognitive factors contributing to impaired spelling performance in school age children with heavy prenatal alcohol exposure
Leila Glass, Clinical Psychology (D)
Session E-4
Oral Presentation: Fire and Flames
Saturday, March 9, 2013, 9:00 am
Location: Love Library 410

462  9:00 am  
*Wildland Firefighter Health and Safety Monitoring Methods*  
Monica Mares, Biology/Environmental Science (U)

463  9:15 am  
*Examination of the Wildland-Urban Interface Fire Dynamics Simulator in Modeling of Laboratory-Scale Surface-to-Crown Fire Transition*  
Drew Castle, MSME (M)

464  9:30 am  
*Wildland Firefighter Health and Safety Monitoring Methods*  
Monica Mares, Biology/Environmental Science (U)

465  9:45 am  
*Wildland Firefighter Health and Safety Monitoring Methods*  
Monica Mares, Biology/Environmental Science (U)

Session E-5
Oral Presentation: Environmental Science
Saturday, March 9, 2013, 9:00 am
Location: Love Library 260

468  9:00 am  
*Examining Species Connectivity of a Proposed Wildlife Corridor in Southern California*  
Nan Nourn, Environmental Sciences (U)

469  9:15 am  
*Impacts of an invasive mussel on sea floor biogeochemistry and community composition in a Southern California estuary*  
Jennifer Schefski, Biology (U)

470  9:30 am  
*Thermal and nutrient dynamics in a chronically eutrophied drinking water reservoir*  
Raymond Lee, Geography (M)

471  9:45 am  
*Physiological effects of climate change on the giant kelp, Macrocystis pyrifera*  
Matthew Brown, Ecology (M)

472  10:00 am  
*Integrating Pattern with Process: Great Pacific Fracture Zones Correspond With Tectonically Homologous Biogeographic Boundaries in Western North America*  
Andrew Gottscho, Evolutionary Biology (D)

Session E-6
Oral Presentation: Identity: Resistance, Bias, Stereotyping, and Change
Saturday, March 9, 2013, 9:00 am
Location: Love Library 261

473  9:00 am  
*The Cult of Rooster*  
Jessica Rowe, English (U)

474  9:15 am  
*Satire and the Carnivalesque in Flann O’Brien’s The Third Policeman*  
Alma Castro, English (U)

475  9:30 am  
*Marriage's Institutional Gender Bias and The Same-Sex Marriage Debate*  
Joshua Stutz, Philosophy (U)

476  9:45 am  
*Male Homosexuality in Late Imperial China: Masculinity, Femininity, and Gender Repair*  
Jonathan Eng, History (M)

477  10:00 am  
*Intersections of Identity through the Linguistic Performance of an Openly Gay Christian Minister*  
Amanda Meza, Linguistics (M)
Session E-7

**Oral Presentation:** Graduate Research in Cell Biology
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 76

478 9:00 am
*The Role of Placental Extracellular Matrix in Trophoblast Differentiation*
Trishana Smith, Biology (U)

479 9:15 am
*Biomedical Image Analysis with CUDA based concurrent computations of cardiomyocyte contractility*
Hung Nguyen, Computational Science (M)

480 9:30 am
*Hypervariable Immunoglobulin-like Domains: An Edge for Bacteriophage Adaptation to Their Host*
Lauren Paul, Microbiology (M)

481 9:45 am
*Sustained Reduction in Neurogenesis Following the Establishment of Persistent Coxsackievirus Infection in the Host*
David Vinh-Phuc Nguyen, CMB (M)

482 10:00 am
*Role of mitophagy in statin-mediated myopathy*
Mridula Ramesh, Biology (M)

483 10:15 am
*Characterization of selective autophagy as a host defense mechanism against intracellular pathogens*
Andrew Cutting, Cell and Molecular Biology (D)

Session E-8

**Oral Presentation:** History and Communities
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 76

484 9:00 am
*A Mountain among Mountains: The Origin, History, Significance and Future of Salvation Mountain*
Toni Bracamonte, History (U)

485 9:15 am
*The Riparian Vegetation of San Diego's Mission Valley*
Aaron Wade, Geography (M)

486 9:30 am
*The Face of Victorian England: How the Victorians Used Architecture to Create a Permanent Link Between the Past and the Present*
Courtney Lyell, History (M)

487 9:45 am
*City in Motion: Growth and Development in Mission Bay and Mission Valley*
Matthew Vasilakis, History (M)

Session E-9

**Oral Presentation:** Art and Identity
Saturday, March 9, 2013, 9:00 am
Location: Love Library 406

488 9:00 am
*From Street Art to Occupy, Is There a Connection? The Politicization of Protest and Art as Tools for Social Change*
Diana Trinidad, Women Studies (U)

489 9:15 am
*Obsessive Compulsive: (Dis) Order*
Alexandra Hopp, Art (M)

490 9:30 am
*Unmasking the Narrative: Asian American Activism in Secret Identities: Asian American Superheroes Comics Anthology and Shattered: The Asian American Comics Anthology*
Jonathan Valdez, Liberal Arts and Sciences (M)

491 9:45 am
*The Art of Communication: Tattoos as a form of Communication in the Criminal Social Structure*
Mahalia Crotz, MPA and CJ (M)

492 10:00 am
*The Chile Film (La Sangre Roja y Verde de Nuevo Mexico)*
Kelly Urg, Television, Film and New Media Studies (M)

493 10:15 am
*Toying with Stereotypes: Designing Alternatives to Polarized Representations of Gender Roles in Toys*
Courtney Harmon, Graphic Design (M)
Session E-10
**Oral Presentation:**
Undergraduate Research in Molecular Biology
Saturday, March 9, 2013, 9:00 am
Location: Love Library 408

494 9:00 am  
*Metalloantibody LT1002 Uses Ca$^{2+}$ to Bridge Antigen*  
Aaron Ward, Biochemistry (U)

495 9:15 am  
*Examining double-strand break repair in vivo*  
Daryl Howden, Biology (U)

496 9:30 am  
*Bacteriophage Adherence to Mucosal Surfaces: Protecting the Underlying Epithelium from Cell Death*  
Rita Auro, Biology (U)

497 9:45 am  
*Adaptation of a High Throughput Assay to Monitor Cellular Protease Processing of the Hepatitis C Proteome.*  
Samantha Diaz, Biology (U)

498 10:00 am  
*Identification and Characterization of Genetic Suppressors of PINK1 Mitochondrial Phenotypes in Drosophila melanogaster*  
Mastaneh Nikravesh, Biology (U)

499 10:15 am  
*Kinetic Studies Of Phage Lambda Integrase-mediated HJ Resolution*  
Steven Esquivel, Microbiology (U)

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Session E-11
**Oral Presentation:**
Mathematical Modeling and Equations
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 63

500 9:00 am  
*Perturbed System of Linear Differential Equations*  
Ismael Perez, Mathematics (U)

501 9:15 am  
*A Method for Minimizing Computing Core Costs in Cloud Infrastructures that Host Location-Based Advertising Services*  
Vikram Ramanna, Computer Science (M)

502 9:30 am  
*Stability and Performance Analysis of the Castillo-Grone Mimetic Operators in Conjunction with RK3 Time Discretization in Solving Advective Equations*  
Mohammad Abouali, Computational Science (D)

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Session F-1
**Oral Presentation:**
Undergraduate Research in Neuroscience
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 2203

503 10:45 am  
*Impact of methodological variables on local functional connectivity measures in autism spectrum disorders (ASD)*  
Jose Maximo, Psychology (U)

504 11:00 am  
*Hemispheric asymmetry of white matter microstructure in autism spectrum disorder*  
Jeffrey Treiber, Psychology (U)

505 11:15 am  
*Temporal Order Memory Deficits in Huntington’s Disease*  
Ashley Emami, Psychology (U)

506 11:30 am  
*Is X-ray Florescence Imaging, a Valid Measure in Examining Differences in the Metal Concentrations of Postmortem and Resected Brain Tissue?*  
Laura Frutos, Psychology (U)

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Session F-2
**Oral Presentation:** Latina Health III
Saturday, March 9, 2013, 10:45 am
Location: Love Library 430

507 10:45 am  
*Psychological Health and Somatic Problems among Latino/a Undergraduates*  
Melissa Torres, Psychology (U)

508 11:00 am  
*Family-of-Origin, Distress, and Self-Worth Among Latino/a Undergraduates*  
Noemi Suisala, Psychology (U)
Session F-3

Oral Presentation: Solar Energy and Nuclear Physics
Saturday, March 9, 2013, 10:45 am
Location: Love Library 431

511 10:45 am
Environmental and Biological Impacts of Nuclear Energy and Radiation Exposure
Anastasiya Irkhin, Environmental Sciences (U)

512 11:00 am
Fluid Flow and Radiative Heat Transfer Modeling of a Small Particle Solar Receiver
Pablo Fernandez del Campo, Mechanical Engineering (U)

513 11:15 am
An Experimental X-ray Source Characterization Method for Dosimetry Simulations in CT
Mitch Sommerville, Medical Physics (M)

514 11:30 am
Thermal Radiation Modeling and Optical Analysis of a Window for Small Particle Solar Receiver Using the Monte Carlo Ray Trace Method
Ahmet Mecit, ME (M)

515 11:45 am
Two Dimensional, Spectral Thermal Analysis of a Planar Window Used in a Solar Thermal Receiver
Alex Whitmore, Thermal Sciences (M)

Session F-4

Oral Presentation: Philosophical Inquiries
Saturday, March 9, 2013, 10:45 am
Location: Love Library 410

516 10:45 am
A Physicalist’s Response to the Knowledge Argument
Brett Castellanos, Philosophy (U)

517 11:00 am
Kierkegaard: Regarding the Three Stages of Life
Brian Thomas, Philosophy (U)

518 11:15 am
A Unified Theory of Ethics
Rashed Ahmad, Philosophy (U)

519 11:30 am
Buddhist Philosophy as a Testable Hypothesis
James Shohfi, Philosophy (M)

520 11:45 am
Does Hybrid Minimalist Theism Make a Difference?
Jake Borcher, Philosophy (M)

Session F-5

Oral Presentation: Antennas and Receivers
Saturday, March 9, 2013, 10:45 am
Location: Love Library 260

521 10:45 am
The study of the effects of different loading armor materials on the spiral antenna
Phu Tran, Electrical Engineering (M)

522 11:00 am
Investigations of Wideband Microstrip E patch antenna array on Curved Surfaces
Anusha Kalikonda, Master of Engineering (M)

523 11:15 am
A Circularly Polarized Multimode Patch Antenna with Full Hemispherical Null Steering for GPS Applications
Nathan Labadie, Electrical Engineering (D)

524 11:30 am
Frequency Agile Polarization Reconfigurable Varactor Loaded Microstrip Circular Patch Antenna
Behrouz Babakhani, Computational Science (D)

525 11:45 am
An Efficient Symbol Timing Recovery Method Based on Polyphase Perfect Reconstruction Channelizers
Xiaofei Chen, Electrical Engineering (D)
Session F-6
Oral Presentation: Fluids and Flows
Saturday, March 9, 2013, 10:45 am
Location: Love Library 261

526 10:45 am
Fluid-structure interaction problems: the nonlinear analysis of Prandtl plane joined wings
Alan Marquez, Aerospace Engineering (U)

527 11:00 am
No Title Provided
Racha Lwali, Aerospace Engineering (U)

528 11:15 am
Using a mobile phone to launch a liquid fueled rocket
Travis Wyatt, Aerospace Engineering (U)

529 11:30 am
Preparing SDSU’s Low Speed Wind Tunnel for Subsonic Flow Testing of Turbine Inlet Guide Vanes
Ricardo Torres, Aerospace Engineering (M)

530 11:45 am
High fidelity numerical computation of finite time Lyapunov exponents using spectral element methods
Daniel Nelson, Aerospace (D)

Session F-7
Oral Presentation:
Graduate Research in Public Health
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 76

531 10:45 am
Motivational Interviews in a Physical Activity Intervention among Latinas
Sandra Soto, JDP Health Behavior (D)

532 11:00 am
Utility Bicycling as Part of a Sustainable Urban Policy and Public Health Policy
Jefferson Gamoning, Public Administration (M)

533 11:15 am
Testing the Role of Physical Acceptance in the Exercise and Self-Esteem Model in College Students
Kayli Dalton, Exercise Physiology & Nutritional Sciences (M)

Session F-8
Oral Presentation:
Graduate Research in Exercise and Kinesiology
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 78

534 10:45 am
Validity and reliability of a customized Wii Balance Board to improve objectivity of the BESS test
Jasper Chang, Kinesiology (M)

535 11:00 am
Effects of a Six-Week Wii Balance Training Protocol on Dynamic Balance
Jacob Schwartz, Kinesiology (M)

536 11:15 am
Estimating Daily Bicycle Volumes Across a Community Roadway Network
Caleb Schroeder, City Planning (M)

537 11:30 am
Impaired balance control in Autism Spectrum Disorders is correlated with neuropsychological measures of symptom severity
Sarah Kirtland, Kinesiology: Rehabilitation Science (M)

538 11:45 am
Proprioceptive neuromuscular facilitation (PNF) produces dramatic, temporary improvements in elbow flexor spasticity
Tomas Gonzales, Kinesiology (M)

Session F-9
Oral Presentation:
Womens’ Agency and Activism
Saturday, March 9, 2013, 10:45 am
Location: Love Library 406

539 10:45 am
Voices in Contralto: Los Angeles National Organization for Women Equal Rights Amendment Activism and Failure
Lucio Quintero, Women’s Studies (U)

540 11:00 am
The Effects of a Supporter’s Retelling of a Rape Victim’s Disclosure
Beth Bollinger, Communication (M)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Department (Gender)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15</td>
<td>Alcoholics Anonymous and Female Empowerment</td>
<td>Lindsay Bond, Women's Studies (M)</td>
</tr>
<tr>
<td>11:30</td>
<td>“Neltiz notiatol mochihuaz, ‘My statement is to be carried out and done’”: Nahua Women’s Status and Agency in Eighteenth-Century Toluca Valley Testaments</td>
<td>Moriah Gonzalez-Meeks, History (M)</td>
</tr>
<tr>
<td>11:45</td>
<td>“Nothing is impossible to a determined woman.” The Unexplored Louisa May Alcott</td>
<td>Caitlin Wion, History (M)</td>
</tr>
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</table>

Session F-11

Oral Presentation: Evolutionary Biology II
Saturday, March 9, 2013, 10:45 am
Location: Love Library 408

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Department (Gender)</th>
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</thead>
<tbody>
<tr>
<td>10:45</td>
<td>Multilocus species delimitation in the Bishopella laciniosa species complex (Arachnida, Opiliones) from the southern Appalachian Mountains</td>
<td>Erika Garcia, Zoology (U)</td>
</tr>
<tr>
<td>11:00</td>
<td>Phylogenetic Inference of the Western Rattlesnake Complex Using Mitochondrial DNA</td>
<td>Narina Brothers, Kinesiology (U)</td>
</tr>
<tr>
<td>11:15</td>
<td>Pinniped skull-duggery: The evolution of feeding strategies in phocid seals</td>
<td>Sarah Kienle, Biology (M)</td>
</tr>
<tr>
<td>11:30</td>
<td>The inference of basal snake phylogenetic relationships: The importance of combining molecular, morphological and fossil data</td>
<td>Sean Harrington, Evolutionary Biology (D)</td>
</tr>
</tbody>
</table>
**ABSTRACTS BY SESSION**

**Session A-1**

**Oral Presentation:**

**Disease Prevention, Detection, and Cures**

Friday, March 8, 2013, 9:00 am

Location: Library Addition 2203

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**100 9:00 am**

**Azaspirene: A newer, milder and patient-friendly treatment for cancer**

Juan Rodriguez, Chemistry (U)
Mike Bergdahl, Chemistry

Hypothesis: Azaspirene is a fungal metabolite with anti-angiogenic and suspected anti-inflammatory properties. Using such properties, a milder type of chemotherapy may be possible: while conventional chemotherapy treatments or radiation attempts to kill cancer cells directly affecting the patient, azaspirene is remarkable in that it prevents nutrients from reaching tumor cells by blocking their unique chemical signal to attract blood vessel growth, but does not inhibit normal blood vessel growth nor wound repair. Therefore, the total synthesis of azaspirene could be considered as a promising new, milder and patient-friendly treatment for cancer.

Methods: This work is innovative in the following ways: 1) in its progress toward a more economical, shorter route to the synthesis of azaspirene; 2) in the potential of this route to easily create a large library of more than 60 related compounds; and 3) to further explore the cancer treatment facility of azaspirene and its related compounds.

Results: Our results are based on an approach which starts with inexpensive D-Aspartic Acid, which contains the stereochemistry necessary to easily achieve one half of the highly-oxygenated spiro double-ring system with each of its atoms in the correct position, and greatly simplifies the route to azaspirene and its related compounds.

Conclusions: The reported synthetic strategy used will 1) complete the total synthesis of azaspirene and pseurotin analogs at SDSU and 2) evaluate the potential of azaspirene to serve as an anti-angiogenic, anti-inflammatory, and anti-breast tumor agent at UCSD and Moores Cancer Center.

Acknowledgements: Funding for this project has been provided by NIH, Pfizer and SDSU Foundation. PhD candidates: M. Barker, D. Schmit and T. Montgomery for their support.

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**Poster presenters are required to stand by their poster during the entire 1-hour and 45 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.**

**Please turn off all cell phones and other devices.**

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**Student Level:** (U)=Undergraduate; (M)=Masters; (D)=Doctoral

**101 9:15 am**

**Analysis of Oral Microbiota in Human Cancer Subjects**

Erin Fletcher, Microbiology (U)
Kelly Doran, Biology

Recent research suggests that oral microbiota may be indicative of pancreatic disease; however, whether specific oral bacterial species are causative or can be reliable indicators of disease is not known. This project aims to characterize the oral microbiota of patients with pancreatic and other digestive cancers compared to healthy controls. We are prospectively enrolling subjects seen in the UCSD Medical Center Endoscopy Clinic. We are collecting saliva, buccal swabs, and information on patient demographics including ethnicity, oral hygiene and tobacco usage, which is lacking from existing literature. We have enrolled 59 patients, just under half (n=25) are female and the average age is 59.2 years. Five patients have been found to have pancreatic disease. Ten others were diagnosed with other cancers, while 6 others may be pre-metastatic. Patient enrollment is ongoing and medical records will be followed for 12 months. Initial analysis of saliva samples by immunofluorescence revealed a high bacterial load. In pilot experiments, DNA was isolated from several samples for PCR amplification of the 16S rDNA hypervariable V4-region. We are using pyrosequencing to analyze the amplification product, and taxa will be assigned according to the Ribosomal Database Project Classifier. We are currently extracting DNA from all existing samples for future PCR amplification and sequence analysis. Following classification of the oral microbiota, we will also culture the saliva samples for confirmation of differences in bacterial populations. Our results will determine whether significant differences are present in the oral microbiota by disease group and if various microbes may be effective indicators and/or predictors of cancer progression.

**102 9:30 am**

**The effects of contaminated fish oil supplementation on lipid profile, inflammation and antioxidant levels**

Valerie Wright, Foods and Nutrition (U)
Mee Young Hong, Exercise and Nutritional Sciences

Objective: The effects of contaminated fish oil compared to regular fish oil on lipid profile, antioxidant levels, and liver damage.

Methods: Thirty male Sprague-Dawley rats (~142 g) were divided into three groups for nine-week feeding of fish oil, contaminated fish oil, or a control diet. Food and water intake were monitored throughout the study, and weight gain was measured prior and at the conclusion of the study. The subjects were euthanized and blood was collected to assess lipid levels, total antioxidant level, antioxidant enzyme activity, and liver function enzyme activity.

Results: Fish oil groups regardless of contaminants decreased TG and LDL, and increased HDL compared to control (p<0.05). Regular fish oil appeared to be preferred in elevation of SOD and...
GST activity compared to contaminated and control (p<0.05). Antioxidant capacity of contaminated fish oil was lower than regular fish oil and control (p<0.05). Contamination appeared to increase ALT activity compared to regular fish oil and control (p<0.05). LDH activity appeared to be lower in regular fish oil compared to contaminated and control (p<0.05). Conclusion Contaminated fish oil may decrease the risk of cardiovascular disease by improving blood lipid profile. However, the risks may outweigh the benefits due to lowered antioxidant capacity and possible liver damage from the contaminants.

103 9:45 am
**Correlates of Hepatitis C Antibody Testing among Injection Drug Users in San Diego, CA**
Sandeep Bhaurla, Epidemiology (M)
Suzanne Lindsay, Graduate School of Public Health

Hepatitis C virus (HCV) is the most prevalent blood-borne disease in the world, infecting more people in the United States than HIV. About 80% of those infected with HCV develop complications from the chronic stage of the disease, including cirrhosis of the liver and liver cancer. The Centers for Disease Control and Prevention (CDC) state that injection drug users (IDUs) face the highest risk of HCV transmission due to their unsafe injection behaviors. With the CDC’s recently released recommendation for persons born from 1945 to 1965 to be tested for HCV, it is important for public health leaders to know if HCV testing is readily available and accessible for all populations, especially for IDUs. Considering the current lack of data and programs targeting this group, however, factors associated with and barriers to HCV testing must be identified in order to make any necessary changes to health policy and practices regarding IDUs. From 2009–2010, the UCSD Study to Assess Hepatitis C Risk (STAHR) recruited young adult IDUs in San Diego to complete a risk assessment interview. Among 510 current IDUs, only 51% reported prior HCV testing. This study aims to use multivariable logistic regression to identify factors associated with HCV testing among IDUs including sociodemographic, accessibility, knowledge and behavioral factors. Results from this study will support the use of cayenne pepper in improving antioxidant status, inflammation and lipid profiles to reduce the risk factors of CVD and its associated comorbidities. Supported by SDSU UGP and NUTR 302L class.

104 10:00 am
**Effects of cayenne pepper on antioxidant capacity, antioxidant enzyme activity, inflammation and lipid profiles in DSS treated rats fed an atherogenic diet**
Kyrie Baca, Nutritional Science (M)
Mee Young Hong, Exercise and Nutritional Sciences

Obesity is characterized by a state of low-grade inflammation that is associated with comorbidities such as cardiovascular disease (CVD), the number one cause of morbidity and mortality among all adults in the United States. The inflammatory process is often caused by free radicals and oxidative stress. There is a need in nutritional research to discover functional foods that may help to reduce oxidative stress, inflammation and the risk of chronic diseases. Cayenne pepper is a great source of pungent capsaicinoids (capsaicin, dihydrocapsaicin, and other analogues) as well as dietary antioxidants (flavonoids, phenolic acids, carotenoids, vitamin A, ascorbic acid, tocopherols). The goal of the current study is to determine the effects of cayenne pepper on antioxidant capacity, antioxidant enzyme activity, inflammation and lipid profiles in DSS treated rats fed an atherogenic diet. Forty male weanling (21 days old) Sprague-Dawley rats were divided evenly into four groups (10/group, total N=40) in a 2 (diet) x 2 (treatment) factorial design using an atherogenic diet with or without cayenne pepper supplementation, and with or without Dextran Sodium Sulfate (DSS) inflammation inducing agent for 30 days. Cayenne pepper treatment groups showed significant decreases in serum tryglycerides (P = 0.032), total cholesterol (P = 0.039), LDL cholesterol (P = 0.032), final body weight (P = 0.046), weight gain (P = 0.023), and final epididymal fat weight (P = 0.038) and significantly increased HDL-cholesterol levels (P = 0.046). Total antioxidant capacity was greater in cayenne pepper groups (P = 0.011). Cayenne pepper-fed rats had significantly increased serum superoxide dismutase (SOD) (P < 0.001), catalase (CAT) (P = 0.034), glutathione S-transferase (GST) (P < 0.001), and glutathione peroxidase (GPX) (P < 0.001) activities. The cayenne pepper group also had significantly decreased C-reactive protein levels (P = 0.044). These findings support the use of cayenne pepper in improving antioxidant status, inflammation and lipid profiles to reduce the risk factors of CVD and its associated comorbidities. Supported by SDSU UGP and NUTR 302L class.

105 10:15 am
**AMPK-mTOR Signalling Mediated Cardiac Autophagy Is Repressed In The Context Of Metabolic Syndrome In Various Animal Models Of Metabolic Syndrome**
Nandini Ravindran, Biology (M)
Roberta Gottlieb, BioScience Center

BACKGROUND AND AIMS: Cellular autophagy, a homeostatic self-eating process has been shown to be protective in the heart during starvation, ischemia-reperfusion and other acute stress conditions. Autophagy has been known to be repressed in the setting of obesity and insulin resistance. However, the precise molecular mechanisms regulating autophagy in the context of metabolic syndrome is under thorough investigation. In this study, we examined the effect of two of the major energy sensing pathways, AMPK and mTOR on cardiac autophagy in the setting of metabolic syndrome using animal models of MetS.

METHODS: We used isolated cardiomyocytes(CMs) obtained from Langendorff-perfused hearts of Zucker obese rats as an *in vitro*...
model of MetS. Isolated CM’s from Sprague-dawley rats were used as lean controls. Basal and induced states of autophagy were assessed by treating the CM’s with 1nM phenformin, an AMPK activator; 5uM rapamycin, an mTOR inhibitor; and one hour of starvation. Phosphorylated levels of AMPK and P70S6 kinase were examined in cells by immunoblotting (IB). Autophagy was assessed by examining levels of LC3 I & II and p62 by IB. We also examined autophagy in vivo using heart tissue extracts obtained from diet-induced obese (DIO) mice and pigs. RESULTS: In the MetS models, the AMPK and mTOR pathways appeared intact and responsive to the interventions, similar to the lean controls. However, cardiac autophagy downstream of these pathways appeared repressed or less responsive in the Zucker CMs and in the DIO models. Interestingly, the basal status of activated AMPK and mTOR was altered in the MetS models, both in vitro and in vivo. CONCLUSIONS: Animals with MetS show an altered activated state of the key energy sensors AMPK and mTOR. This alteration may have several pathological consequences, mainly in regulating autophagy. In agreement with the above statement, cardiac autophagy is indeed repressed in animal models of MetS and suggests that altered autophagy may be involved in the increased cardiovascular risk in individuals with MetS.

### Oral Presentation: Astronomy and Physics

**Friday, March 8, 2013, 9:00 am**  
**Location: Love Library 430**

**107** 9:00 am  
**The syzygy of KIC 4150611**  
Trevor Gregg, Astronomy (U)  
William Welsh, Astronomy

We present ground-based photometry of the stellar syzygy of KIC 4150611. A stellar syzygy occurs when three gravitationally bound stars align along our line of sight—an “eclipse-of-an-eclipse.” We believe this is the first ever stellar syzygy to be observed from a ground-based telescope. KIC 4150611 is a quintuple-star system, composed of a pulsating δ-Scuti A-star, a pair of eclipsing K-stars, and another pair of eclipsing G-stars. The K-stars have an orbital period of 1.5 days and eclipse the A-star every 94 days. The G-star pair has an orbital period of 8.6 days, but never eclipses the other three stars. We utilized the data from NASA’s Kepler telescope to predict the occurrence of a syzygy of the A-star and the K-star pair in the summer of 2011, which we then observed with BVI CCD photometry at Mt. Laguna Observatory. These data aid the analysis currently in progress by providing additional constraints on the temperatures of the eclipsing stars, as well as the relative contribution from each star to the total luminosity of the system.
108  9:15 am

**Mass and Radius Measurements of the Kepler Eclipsing Binary Star System KIC 8736245**
Tara Fetherolf, Astronomy (U)
William Welsh, Astronomy (M)

The most accurate way to measure the masses and radii of stars come from cases where the stars eclipse each other as they orbit; these systems are known as “eclipsing binary stars”. Measuring the velocities of the stars gives us their masses and the changes in brightness during eclipses give us their radii. The stellar mass-radius relationship is well understood for stars greater than about 0.8 solar masses. However, for low-mass stars there is a well-known discrepancy between theory and observations, in that the observed radii are often larger than predicted by several percent. We examine the low-mass binary star system KIC 8736245 to help understand the nature of the discrepancy. KIC 8736245 has stars with masses of 0.96 and 0.76 solar masses on nearly circular orbits. Its orbital period is 5.07 days, making the binary more widely separated than most low-mass binary systems that have precise dynamical mass and radius estimates. This is important since tidal effects depend very strongly on the separation of the stars and are suspected as the cause of bloating the stars. We use the extremely accurate photometry from NASA’s Kepler Mission, supplemented with multicolor photometry from SDSU’s Mount Laguna Observatory (MLO) and spectroscopy from the Hobby-Eberly Telescope (HET). Preliminary results show that the stars’ radii are indeed larger than predicted for their mass and ages.

109  9:30 am

**The Radius of the Super-Earth Planet Kepler-9d**
Justin Stevick, Astronomy (M)
William Welsh, Astronomy (M)

Launched in 2009, NASA’s Kepler telescope is designed to search for planetary systems around stars other than the Sun. Planetary transits are detected using extreme precision photometry. The depths of these transits allow astronomers to measure radii of the transiting planets. A particularly interesting goal is to find planets similar in size to the Earth. Kepler-9 is a multi-planet system containing three planets all orbiting a Sun-like star within the Sun-Mercury distance: two Saturn-size planets and a super-Earth-size planet, Kepler-9d. A super-Earth is defined as a planet with a radius between 1.25 and 2.0 Earth radii. The radius of Kepler-9d is somewhat poorly determined: the discovery paper by Holman et al. (2010) reported a radius of 1.5 Earth radii, while a follow-up paper by Torres et al. (2010) reported a radius of 1.64 Earth radii. This makes Kepler-9d one of the smallest known exoplanets around a Sun-like star. Our goal is to more accurately determine the planet’s size as well as other system parameters using over 4 times more data than the previous studies. Preliminary results give a radius of 1.68 Earth radii and a period of 1.59 days.

110  9:45 am

**What is the ultimate fate of our Universe?**
Joseph Fedrow, Astronomy (M)
Douglas Leonard, Astronomy (M)

What is the ultimate fate of our Universe? It has recently been observed that our Universe is expanding at an accelerating rate. We call this acceleration ‘dark energy’. According to the most popular theory of dark energy, the theory of a cosmological constant, the Universe will continue accelerating forever; the result being a cold, lonely, Universe with everything moving further, and further, apart and with no more new stars or galaxies forming. Once the last stars die, that’s it; a futuristic observer would see nothing when they look at the night sky. However, a slowly rolling scalar field has also been proposed as the driving mechanism for the observed dark energy in the Universe. This theory is called ‘Quintessence’ and unlike the cosmological constant it is dynamical in nature; allowing for the possibility of a Universe that accelerates today and does not accelerate tomorrow. This would allow stars and galaxies to continue forming in the future, and give future generations something to look at when they look at the night sky. In this talk I will briefly summarize how we use quintessence models to study the nature of the dark energy and predict the ultimate fate of our Universe.

111  10:00 am

**Detecting Lyman Break Galaxies in the early universe and improving the selection technique**
John Horst, Astronomy (M)
Douglas Leonard, Astronomy (M)

Lyman-Break Galaxies (LBGs) have recently been employed to study the distant universe aiding in our understanding of dark energy, dark matter, and the history of galaxy evolution. Other than their extreme distances and massive star-formation, LBGs are typical galaxies containing 100’s of billions of stars. A “break” in their light spectrum is produced when high-energy photons from young massive stars are absorbed before exiting their host galaxy. This “Lyman-Break” (LB), at the Lyman limit of 912Å, facilitates the detection of LBGs by providing differentiation from the more common nearby galaxies and stars “fakers”. The LBG selection technique is based upon measuring light intensity through filters of differing wavelengths on both sides of the LB resulting in a “color” measurement.

Extending the LBG selection technique to higher energies and further distances, in an attempt to locate extended-LBGs (ELBGs), the Lyman-Alpha Line (LAL) at 1216Å was targeted. Similar to the L8 technique, color-color criteria were chosen to identify a step centered at the LAL. This new LAL criteria were applied to Subaru Telescope deep field images to identify possible ELBG targets. Follow-up spectroscopic observations were conducted at the Keck Telescope. From this data set, obtained
by Jeffrey Cooke between 2003 & 2006, I produced the spectra, discriminated ELBGs from fakers, and refined the analysis techniques. Post-processing software, plotting packages, and a ranking algorithm were developed to qualify 21 high confidence ELBGs and measure their distances. Similarly, 507 fakers were identified and characterized.

The LAL selection criteria proved to be less efficient than the LB. In an attempt for improvement, LAL criteria were extended beyond the single plane of color-color by including limits for both photometric magnitudes and additional colors. The formulation, adjustment, and testing of the criteria showed a robustness and potential for a wide range of applications.

The enhanced LAL selection criteria are anticipated to provide an improvement in ELBG selection efficiency of up to 40% and detect a more complete sampling of energies. Detecting LBGs of all energies may help shed light on some of the major questions in astronomy today. Further refinements of the criteria are planned.

Session A-3
Oral Presentation:
Undergraduate Research in Stem Cells
Friday, March 8, 2013, 9:00 am
Location: Love Library 431

112  9:00 am
Development of an iPSC based screening platform for Parkinson’s disease drug discovery
Cody Smith, Biology (U)
Greg Kalyuzhny, Chemistry

Parkinson’s disease (PD) is a debilitating neurodegenerative disorder characterized by the loss of dopaminergic neurons in the substantia nigra. Previously reported post mortem analysis of patient-derived tissue from the substantia nigra has revealed cytotoxic aggregates of alpha synuclein associated with other proteins called Lewy bodies. A fully penetrant, aggressive form of familial PD is caused by the triplication of the gene encoding alpha synuclein, (SNCA) which leads to a doubling in the expression levels alpha synuclein and Lewy body formation. We plan to develop an in vitro model of PD through the dopaminergic differentiation of an SNCA triplication patient-derived iPSC line that was obtained from the Correlli Cell and DNA Repository. We have successfully cultured and biobanked this iPSC line for future drug screening applications. The cells were characterized using immunocytochemistry for pluripotency markers and embryoid body-based differentiation. Several iPSCs from an existing biobank of iPSCs generated from healthy donors were also characterized as controls.

We hypothesize that upon differentiation into dopaminergic neurons, the iPSCs with SNCA triplication will recapitulate the Parkinson’s disease phenotype in vitro which will provide an ideal model for screening novel compounds that target the disease pathology. At CalAsia Pharmaceutics we are developing several small molecules for neurological disorders including molecules that inhibit FK506 binding proteins which are known to play a role in alpha synuclein aggregation, a hallmark of Parkinson’s Disease pathology. We are now beginning to selectively differentiate these iPSCs towards neural lineages that can be used for screening the FK506 inhibitor compounds. If this model is successful it could potentially lead to the validation of novel drugs for the treatment of Parkinson’s disease.

113  9:15 am
PSC Derived Familial Alzheimer’s Diseased Neurons as a Model for Alzheimer’s Pathology and Drug Therapy Investigation
Patrick Reilly, Biology (U)
Natalie Gude, Biology

Alzheimer’s disease is a neurodegenerative disorder which affects 5.4 million people nationwide and is the sixth leading cause of death in America. It is widely accepted that Neurofibrillary Tangles, aggregates of misfolded tau protein, and Amyloid-β (Aβ) plaque formation play a role in Alzheimer’s pathology. However, acquiring neuronal cell lines from patients is difficult and generates a clear relevance for the need of a system which allows the study of disease pathology in a human cell based model. Our use of induced pluripotent stem cell (iPSC) derived neurons with mutations commonly found in individuals with Familial Alzheimer’s Disease (FAD) provides a unique, in vitro–human cell model for pathological and therapeutic drug investigation. Using iPSC derived neurons with FAD defects, we are investigating tau pathology by comparing diseased lines to wild type (WT) controls via transformed expression of a fluorescently labeled, aggregate promoting tau mutant plasmid. Preliminary data confirms mutant tau plasmid induced aggregation in HEK 293T cells. Furthering this work, through transformation of iPSC derived neurons with the mutant tau plasmid, we expect to see different cellular responses between WT and FAD cell lines to the tau aggregates. Simultaneously, we are interested in exploring various γ-secretase modulator effects on Aβ production through serial drug treatment of iPSC derived neurons in order to determine the compounds effectiveness. Expectations of an effective compound include low concentration responsive curves (IC50 values) while maintaining high efficiency in the compounds ability to lower toxic Aβ species concentrations without lowering total Aβ. We expect that the use of iPSC derived FAD and WT neurons as an in vitro cell model will provide new insights in Alzheimer’s disease pathology and treatment.
114  9:30 am
A Stem Cell Based Approach to Treating Multiple Sclerosis Using Drug-Like Small Molecules
Chelsea Green, Chemistry (U)
Christopher Harrison, Chemistry
Oligodendrocytes, the glia that myelinate nerve axons of the central nervous system, are regenerated throughout adulthood. Widespread populations of oligodendrocyte precursor cells (OPCs) migrate to sites of demyelination, and proceed to mature into oligodendrocytes. The progressive phases of multiple sclerosis (MS) are associated with inhibited differentiation of the OPC adult stem cell population. Remission in MS is largely dependent on OPCs migrating to sites of demyelination and subsequently differentiating into mature oligodendrocytes. This study focuses on controlling stem cell fate and developmental potential through the use of small molecules. Using a high content imaging cell-based assay, we have screened a diverse collection of over 80,000 drug-like small molecules in order to identify the compounds that are directly responsible for stimulating the process of remyelination. OPCs were treated with compound and stained for myelin basic protein. They were then screened using fluorescent microscopy and the intensities of fluorescence analyzed in GeneData. Thyroid hormone was used as a positive control. Compounds within four standard deviations of intensity of the positive control were characterized as hits. A secondary confirmation screen was then conducted in triplicate, as well as a counter screen to filter out compounds that were initially fluorescent. Compounds that passed this second screen were then tested under a dose response. Cells were treated with eight doses, and compounds that induced differentiation at greater than 5μM concentration were characterized as hits. The structures of these compounds were analyzed and several molecular scaffolds that consistently appear as hits have been identified. Representative compounds from the scaffold groups are currently being selected and will be analyzed with Western Blotting and RT-PCR to further characterize their ability to induce OPC differentiation in functioning oligodendrocytes.

115  9:45 am
Using Down Syndrome Induced Pluripotent Stem Cells to Model Alzheimer’s Disease
Kevin Lopez, Biochemistry (Chemistry) (U)
Kathleen McNamara Schroeder, Chemistry
Alzheimer’s Disease (AD) is the most common neurodegenerative disorder affecting 30 million people worldwide. Currently, there are no effective treatments to prevent the onset or reverse the symptoms of AD. Individuals with Down syndrome (DS), caused by a trisomy of Chromosome 21, often suffer from early onset AD. This may be due to the aberrant expression of AD associated genes located on Chromosome 21. One such gene, encoding for Amyloid Precursor Protein (APP), is aberrantly processed in AD producing the pathogenic peptide fragment Aβ1-42 that forms insoluble aggregates in the brain. These amyloid-β plaques are one of the main hallmarks of AD and can be found in brain samples of Down Syndrome patients as young as 8 years old. Due to the difficulty in obtaining post-mortem samples and the length of time it takes for phenotypes to be displayed in AD patients, DS induced pluripotent stem cells (iPSC’s) might serve as a useful model to studying AD pathology in vitro. Toward this goal, we generated iPSCs from DS patients by episomal reprogramming of their dermal fibroblasts. The DS-iPSCs were then differentiated into neurons using a modified dual-Smad inhibition strategy. The resulting neurons were analyzed using electrophysiology, immunohistochemistry, and biochemical methods. Our results indicate that neurons derived from DS-iPSCs can serve as an excellent model that recapitulates some of the neuropathology associated with AD.

116  10:00 am
The Role of HP1α within Heterochromatin and its Effect on Human Pluripotent Stem Cells
Marina Watanabe, Biology (U)
Sandy Bernstein, Biology
Pluripotent stem cells have the capacity to differentiate into all somatic tissues, and as such, are prized for their promising potential in tissue replacement therapy. Human embryonic stem (ES) cells and induced pluripotent stem (iPS) cells are the most commonly utilized pluripotent cells. Though often mistakenly considered equivalent, the two cell types have numerous differences including the presence of two varieties of iPS cells known as primed and naïve that differ in their pluripotency. The mechanisms behind the establishment and maintenance of pluripotency are not fully understood, but it is known that the epigenetic state of chromatin plays a critical part. Greater understanding of epigenetic mechanisms to control pluripotency and directed differentiation will likely improve their utility and manipulation, as well as interrogate the downstream usefulness of these important cell types in clinical applications. To determine the epigenetic differences among ES cells, primed, naïve iPS cells and somatic cells, we set out to investigate the dynamics and architecture of the silenced chromatin, the heterochromatin. Heterochromatin protein 1 (HP1), due to its role as a key heterochromatin regulator, was used as a marker to visualize heterochromatin in live-cell and super resolution imaging beyond the optical diffraction limit at the 30nm level. Fluorescence Recover After Photobleaching (FRAP) experiments of HP1-GFP fusions indicate an increased exchange rate of HP1 proteins in hES cells compared to iPS cells, which are more dynamic than fibroblasts. Light sheet super resolution microscopy results suggest a more isotropic distribution of HP1 proteins in human ES and iPS cells than that in somatic cells. In addition, the results of these studies suggest a more open chromatin state in pluripotency with elevated heterochromatin dynamics.
117 10:15 am  
**Nonsense Mediated Decay and Pluripotency**  
Josh Espinoza, Cellular and Molecular Biology (U)  
Elizabeth Dinsdale, Ecology  

Nonsense mediated Decay (NMD) is a mRNA decay mechanism that functions as a quality control pathway as a regulator of ∼3-15% of the ‘normal’ transcriptome. NMD functions as a quality control pathway by targeting mRNAs with premature termination codons (PTCs). ‘Normal’ transcripts with long 3’ UTRs, introns downstream of exon-exon junctions, upstream open reading frames (uORFs) and alternatively spliced products with PTCs in the exons are also targets for NMD. This mechanism exists to prevent the accumulation of truncated or ‘unwanted’ proteins that may have pernicious effects on cell function. Disfunctional NMD networks are associated with certain neurological disorders such as schizophrenia, autism, and ADHD. Previous data show that UPF1—a core NMD factor—is highly down-regulated as undifferentiated cells are induced to differentiate. I found that preventing the down-regulation of UPF1 in cells that are differentiating perturbs the differentiation process and does not allow proper cellular development. In addition, previous research has found that UPF1 and UPF2 knockouts in mice are embryonic lethal These data lead to the hypothesis that NMD has functional roles beyond quality control and may play a role in the differentiation process. Finding these transcripts is a crucial step in the project and there are currently no reliable programs to find uORFs in sequence data. I constructed a computer script that can scan GenBank files and can determine if the gene of interest has any uORFs. I am analyzing transcripts, suggested by RNA-Seq data, that are up-regulated in UFP3b knockout mice. Also, it would be pertinent to know if a down-regulation of UPF directly correlates with a down-regulation of NMD. To address this question, I am constructing a lentiviral reporter vector that will allow me to quantify the level of NMD in both murine and human cell types. I use a reporter assay and real-time qPCR to measure the levels of NMD and lineage specific transcripts in undifferentiated and differentiated cells.

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Session A-4  
Oral Presentation:  
Graduate Research in Biotechnology  
Friday, March 8, 2013, 9:00 am  
Location: Love Library 260

118 9:00 am  
**Anaerobic Codigestion of Fats, Oils, and Grease**  
Tyler Kirkendall, Environmental Engineering (U)  
Tyler Radniecki, Civil, Construction, and Environmental Engineering  

Anaerobic digestion is commonly applied in the wastewater industry to decrease the volume of organic material produced and to generate biogas, composed primarily of carbon dioxide and methane. With the addition of fats, oils, and grease (FOG), the volume of biogas produced can be increased. To test this hypothesis, batch anaerobic digesters were assembled using 125 mL bottles capped with a septa. Each anaerobic digester was filled with primary effluent, thickened waste activated sludge (TWAS), and vegetable oil. The anaerobic digesters were sealed and purged with nitrogen gas to create an anaerobic environment. The biogas generated was collected daily and the volume was measured with a glass syringe. Additionally, the methane content of the biogas was measured using a sodium hydroxide carbon trap. The biogas was injected into a sealed solution of sodium hydroxide, thus trapping the carbon dioxide in the solution as carbonate. The gas released from the sealed carbon trap was purified methane. With the addition of FOG, biogas production increased in the first three days of digestion when compared to an anaerobic digester without FOG. After the initial three days, the anaerobic digester crashed due to a drop in pH. As FOGs are broken down, an acid is produced which lowers the pH of the system. To combat this issue, a two stage anaerobic digester was introduced. In the first stage, FOG is anaerobically digested for a week. While the methanogens were less productive due to the low pH, the acidogens and acetogens were still productive and continued to produce the acetic acid used by the methanogens. The effluent from the first stage digester was removed and had the pH adjusted to 7. The pH adjusted effluent was transferred to a fresh anaerobic digester with new TWAS and seed bacteria. Due to the initial stage of digestion, the second stage was able to generate an increased volume of biogas for a sustained period of time versus a single stage anaerobic digester with FOG.
119  9:15 am

A novel high-throughput cell-based assay allows for the screening of peptide libraries targeting HIV-1 envelope processing

Zachary Stolp, Cellular and Molecular Biology (M)
Roland Wolkowicz, Biology

Background: While most of the HIV-1 proteome is processed by the viral protease, Furin and similar protein convertases are responsible for the processing of the viral gp160 envelope into gp120 and gp41, in the lumen of the Trans-Golgi Network (TGN). A necessary component for the production of infectious viral particles, we hypothesize that the recognition of gp160 by Furin could become a novel target for drug development against HIV-1. As inhibiting Furin will be detrimental to the cell, we have developed a high-throughput cell-based assay for the monitoring of gp160 processing which will greatly facilitate the search of competitors rather than inhibitors of Furin. Methods: We have engineered a scaffold molecule targeted to the Endoplasmic Reticulum (ER)/TGN for cell surface expression through the classical transport pathway. For that purpose, we have chosen the murine CD8a (Lyt2) as scaffold as it is easily recognized on the cell surface by flow cytometry. Lyt2 was further engineered to contain the gp120/41 boundary flanked by two tags: FLAG and HA. The double-tagged construct was fused upstream of Lyt2 to ensure proper localization of the gp120/41 boundary within the ER/TGN lumen. Retroviral technology was used to transfer the engineered scaffold in T-cells, allowing for its stable expression. T-cells were chosen to mimic the natural milieu of HIV-1 infection.

Results: The double-tagged engineered scaffold allows for the discrimination between cleaved and non-cleaved events based on the cell surface expression of one tag; HA, or two; FLAG and HA, respectively. Our results clearly show a drastic reduction of FLAG surface expression with a scaffold containing the wild-type gp120/41 boundary in comparison to its mutant counterpart.

Conclusion: We have developed an assay where FLAG cell-surface expression can be used as a biosensor for the activity of Furin and similar peptidases. The high-throughput flow cytometry-based nature of the assay will allow for the screening of drugs targeting HIV-1 envelope recognition and processing. Moreover, the assay should help elucidate the still unclear mechanisms of gp160 maturation. HIV-1 envelope maturation should become a novel attractive target for the inhibition of HIV infection.

120  9:30 am

Autologous Blood Doping Screening Through Capillary Electrophoresis

Chuan (Jack) Fang, Chemistry (M)
Christopher Harrison, Chemistry

In sports competitions, athletes may resort to doing whatever it takes to win. One of the illicit methods used by athletes to gain an advantage is blood doping (or blood transfusions). This is a practice used to raise an athlete’s red blood cell count thus increasing the transportation of oxygen to muscle tissue, resulting in higher stamina and performance. Currently, homologous and autologous blood transfusions are used by athletes; typically this is observed in endurance sporting events. Homologous blood transfusions, where an athlete gets blood from another person, are able to be detected by flow cytometry. Meanwhile autologous blood doping, where the transfusion is done by taking the athlete’s own blood and refrigerating it until future use, is not currently able to be detected directly. This project has been inspired by this inability to detect autologous blood doping and we are establishing a capillary electrophoresis based method to meet this need.

By using capillary electrophoresis, we have developed a method that allows us to distinguish between the clean and doped blood samples. The instrument has numerous advantages over other analytical instruments, including: higher resolution, smaller sample volume requirements, and shorter analysis times. A transfusion can be seen based on the electrophoretic mobility differences of the red blood cells. The mobility of the cells is the result of the natural aging process of the red blood cells, as well as the storage of transfused blood. In particular the storage of the red blood cells alters the cells size, leading to the mobility differences that we observe. The mobilities differences are even more apparent in athletes as they have fewer old erythrocytes in circulation. As a result, we are able to identify, in vitro doped samples, with as little as a 5% transfused blood volume, from sedentary and athletic control volunteers.

121  9:45 am

Planarians as a model to investigate factors regulating adult neurogenesis

Martis Cowles, Biology (D)
Ricardo Zayas, Biology

Neurons are born from stem cells and undergo differentiation by a process known as neurogenesis. This phenomenon occurs not only in development, but also in the adult central nervous system (CNS) where new neurons continue to be generated. In spite of this, most animals lack the capacity to properly repair damage to the CNS after injury or disease. Conversely, the planarian (flatworm) Schmidtea mediterranea can completely regenerate its CNS from a population of adult stem cells that are maintained throughout their life. Remarkably, nearly 25% of cells in planarians are stem cells; however, it is estimated that less than 5% of this population are truly pluripotent. Thus, it remains unclear what fraction of the stem cell pool contributes to the formation of new neurons. To this end, we sought to identify stem cell subpopulation(s) involved in neurogenesis by characterizing the basic Helix-Loop-Helix (bHLH) transcription factor gene family, which plays conserved roles in neural differentiation across widely divergent species. We identified 44 planarian...
bHLH homologs genome-wide and screened their expression and function for roles in CNS regeneration. Our screen identified three genes of interest based on their exclusive expression in stem cells and neurons, including homologs of collier/oftactory/early B-cell factor (coe), hairy/enhancer of split (hey), and single-minded (sim). To characterize coe⁺, hey⁺ and sim⁺ stem cells, we performed lineage-tracing experiments using the BrdU (a thymidine analog) to label cycling cells and track their fate after cell division. We found that coe, hey and sim are expressed in proliferating cells adjacent to the CNS, which can be traced to the brain or ventral nerve cords over the course of two days. Our data indicate that coe, hey and sim label unique subsets of neural progenitor cells. We are currently performing double-pulse-chase experiments using BrdU and F-ara-EdU (a new nucleotide analog) to examine if these neural progenitors represent transient amplifying cells that contribute to CNS maintenance. Our characterization of neural progenitors in planarians has set the stage to use this model organism of regeneration to investigate how adult stem cells interpret and respond to genetic and environmental cues during CNS repair.

122 10:00 am
 Addition of a Short Beta-Hairpin Sequence Enhances Recombinant Expression of Two Small Helical Domains
 Melissa Lokensgard, Biochemistry (D)
 John Love, Chemistry & Biochemistry

The lab of Dr. John Love has empirically established different expression levels in E. coli for two recombinant proteins with high similarity in sequence, size, and biological function. Streptococcal Protein G B1 domain (an IgG binding protein) and many variants of varying thermal stability can be easily expressed in high yield in E. coli. Staphylococcal Protein A (another IgG binding protein) cannot be stably expressed in the cytosol due to rapid ATP-dependent degradation by the host organism, but can be expressed either as a carboxy-terminal Ubiquitin fusion or with the amino-terminal periplasmic localization sequence pelB. The primary difference between Protein G and Protein A is secondary structure composition—Protein G contains two short beta-hairpins and an alpha helix, and Protein A is a three-helix bundle. Reasoning that the beta-hairpins may impart stability-related degradation resistance to Protein G and its variants, several chimeras of Protein A and the Protein G beta-hairpins were created and their expression levels analyzed by SDS-PAGE. Addition of 12 amino acids of one hairpin of Protein G to either terminus of Protein A enhances recombinant expression significantly. This unexpected result has been duplicated for the D. melanogaster Engrailed homeobox DNA binding domain, a protein similar to Protein A in its size, secondary structure, and low expression yield. Despite ProtParam-predicted instability of the modified proteins, all of the mutants containing the beta-hairpin sequence are soluble. Our result is most likely due to decreased degradation of the chimeric protein by the AAA+ family E. coli proteolytic complex ClpAPS. Current and future work will explore what, if any, changes in structure or protein-protein interactions with the ClpAPS complex or subunits account for the observed reduction in degradation of the proteins that contain the 12-amino acid sequence.

123 10:15 am
 RNAi in Ascidians: Developing a tool to knockdown gene expression in Ciona intestinalis
 Victoria Hurless, Biology (D)
 Robert Zeller, Biology

RNA interference, or RNAi, is a post-transcriptional process that regulates gene expression by silencing mRNA targets through degradation. RNAi is initiated by a small RNAs (such as microRNAs or siRNAs) base pairing to their mRNA target that is then recognized for degradation. microRNAs are small RNAs about 20 nucleotides in length and regulate their gene targets by binding to specific sequences in the 3’UTR (untranslated region) of the mRNA transcript. Many techniques employ the use of microRNAs or siRNAs to silence genes in order to determine their function, for example, during animal development or cancer. RNAi is powerful tool to study gene function and has been established in model organisms such as Drosophila, C. elegans, Planarians, Arabidopsis, Mice, and mammalian cell lines. However, in the organism our lab studies, the marine invertebrate chordate Ciona intestinalis, RNAi approaches have not yet been adapted and implemented. Our lab has developed an innovative method to develop mRNA target specific RNAi utilizing artificial microRNAs to knockdown genes of interest in C. intestinalis. We have been successful in knocking down two genes that result in expected phenotypes, one of which displays a similar phenotype to a published null mutant. Our future directions are to explore the rules governing microRNA target silencing by employing the use of various algorithms and programs followed by further experimentation. Refining the mechanism of this tool will allow for the widespread use of RNAi in ascidians further proving them as an ideal model for chordate development and genomics.

124 10:30 am
 A novel C5a-derived immunobiotic peptide promotes pathogen clearance in vivo through targeted bacterial killing
 Katy Patras, Biology (D)
 Kelly Doran, Biology

We have developed a unique immunostimulatory peptide, known as EP67, originally derived from the C-terminal region of human complement component C5a. We have previously shown in vivo that subcutaneously, EP67 promotes cytokine release through the CD88 receptor (C5a receptor 1), resulting in increased neutrophil infiltration which drastically reduces Staphylococcus aureus.
(MRSA) skin lesions compared to controls. Interestingly, we discovered that EP67 also directly inhibits the growth of various Streptococcal species, including *Streptococcus agalactiae* (group B streptococcus, GBS), in vitro. GBS is a Gram-positive bacterium, which colonizes the cervicovaginal tract in 20-30% of healthy women. Colonization is asymptomatic, however, GBS can be vertically transmitted to newborns peripartum, causing severe disease such as pneumonia, sepsis and meningitis. Current prophylaxis, consisting of late gestation screening and intrapartum antibiotics, has failed to completely prevent transmission, and GBS remains the leading cause of bacterial neonatal meningitis in the United States. Due to the lack of an effective vaccine and emerging antibiotic resistance, exploring novel treatment strategies, like EP67, is necessary. Using mouse models of GBS peritoneal infection and vaginal colonization, we found that EP67 treatment results in rapid clearance of GBS from both peritoneal and vaginal cavities, but does not impact other native vaginal flora. These findings led us to elucidate the method by which EP67 promotes GBS vaginal and peritoneal clearance. We reveal that this clearance is due to EP67 directly killing GBS, rather than stimulating an increased immune response seen in other pathogenic models, by using CD88 KO and CXCR2 KO mice to examine receptor signaling and neutrophil recruitment in both vaginal colonization and peritoneal infection models. From this work, we conclude that EP67 has potential as a therapeutic to control GBS colonization and infection. Continued studies seek to determine the exact mechanism by which EP67 differentially targets and kills GBS and other Streptococcal species.

**Session A-5**

**Oral Presentation:**

Graduate Research in Molecular Biology

Friday, March 8, 2013, 9:00 am

Location: Love Library 261

**125  9:00 am**

*Investigation of lambda phage-like systems in marine microbial communities from Iquique, Chile and the Abrohlos Bank, Brazil*

Noriko Cassman, Bioinformatics (M)

Elizabeth Dinsdale, Biology

Two major motifs of phage insertion into the bacterial host genome during lysogeny are (1) random transposition as in Mu phage-host systems and (2) site-specific recombination as in the *E. coli* Lambda phage system. Here a measure of lambda phage-like insertion of temperate phages to bacterial hosts is examined in marine microbial metagenomes through the development of a custom database of attachment sites. We pyrosequenced viral and induced viral metagenomes from the surface layer off the Abrohlos Bank in Brazil and from the anoxic core of the oxygen minimum zone (OMZ) off Iquique, Chile. Unique profiles of oligomer frequencies were found in the induced metagenomes, indicating successful induction of viruses. Custom Perl scripts were used to find exact repeats 15 bp in length from the prophage regions determined by PhiSpy of 14 of 34 fully annotated marine bacterial genomes from NCBI, and from cross-contigs generated from viral and bacterial metagenome cross-assemblies. We expect that the extreme OMZ environment will reflect a higher measure of lambda phage-like insertions compared to the surface Abrohlos environment.

**126  9:15 am**

*Cystic Fibrosis Transmembrane Conductance Regulator (CFTR)-like Protein in Hydra vulgaris*

Michelle Petitfils, Microbiology (M)

Forest Rohwer, Biology

Cystic Fibrosis transmembrane conductance regulator (CFTR) is an ion channel protein involved in passively transporting chloride (Cl\(^{-}\)) and bicarbonate (HCO\(_3\)\(^{-}\)) across the apical membrane of epithelial cells in the lungs as well as in the sweat duct, pancreas, and intestine. Mutations in CFTR cause a recessive genetic disorder, Cystic Fibrosis (CF). The underlying symptoms of CF include thick mucus that can block organ passages and accumulate bacterial biofilms, leading to an early death. While the function of the CFTR protein has been studied in mammals, extensive investigations into the evolution of the CFTR protein as well as model organisms for CF are lacking. Mice have been used as model organisms for the gut in CF, but they do not produce a similar phenotype in the lung. Pigs are excellent models, but they are prohibitively expensive and require extensive medical intervention to survive. The focus of this work is to study the evolution of the CFTR, and to determine if the species* Hydra vulgaris* (small, basal organisms in the phylum Cnidaria), may provide a new model organism for studying CF. *Hydras* have an exposed mucosa and many conserved genes to humans. *Hydras* also have an innate immune system similar to ours as well as mucus-secreting cells identical to those in vertebrates. Using bioinformatic analyses, a CFTR-like protein was found in *Hydra*, which contains several important regions for CFTR function and has an identical predicted structure compared to human CFTR. *Hydras* were treated with CFTR inhibitors, CFTR-inh 172 and Gly-H 101, which resulted in negative effects on *Hydra* health and made them more susceptible to bacterial infection. To look at the specific protein found from bioinformatics studies, RNAi is being performed to knock out the* Hydra vulgaris* CFTR homologue. Other studies involve looking at chloride transport in *Hydras* as well as the addition of bicarbonate to CFTR-inhibited *Hydras* to see if this could rescue the negative effects of the inhibitors. If these studies show that *Hydras* have a functional CFTR-like protein, *Hydras* may be a cheap and effective model organism for Cystic Fibrosis.
**127  9:30 am**

**Analysis of Copper Genes in Vibrios**

Shashank Sathe, Bioinformatics (M)  
Elizabeth Dinsdale, Biology  
Ralph Feuer, Biology

*Vibrios* from 7 different sites across San Diego Bay were isolated and analyzed to study copper tolerance mechanisms. San Diego Bay displays high amounts of copper in the water, with copper levels ranging from 6-24 ppb. Genomes were studied to identify factors that help them sustain such high levels of copper in the water. The genomes were first annotated using RAST and the copper genes were identified. They were then searched using BLAST+ tools, specifically for the existence of other known copper genes previously unidentified by RAST. Contrary to the expectation that high levels of copper may require higher number or expression of copper tolerance genes, discrepancies were observed among Scs operons responsible for copper tolerance. All genomes showed a lack of ScsA operon, while SscC gene from the SscBCD operon was absent in most of the genomes. Since both operons are required for copper tolerance, it can be inferred that Scs genes do not participate in copper tolerance in these *Vibrios*. Cop operons, involved in copper tolerance and homoeostasis, also displayed missing genes among YZAB operon. Multiple copies of Cop genes such as Cop R and S were also observed. All the observed changes may suggest an altered mechanism of copper tolerance in these microbes. It remains to be determined if these changes are adaptations of the *Vibrios* to increased copper levels.

**128  9:45 am**

**Virus-Induced Formation of Exosomes and Coxsackievirus Dissemination in the Host**

Vrushali Mangale, Biology (M)  
Ralph Feuer, Biology

Coxsackievirus is a relatively common enterovirus belonging to the picornaviridae family that is capable of causing aseptic meningitis, pancreatitis and myocarditis in humans. Previously, we genetically engineered a recombinant coxsackievirus expressing “fluorescent timer” protein (Timer-CVB3). “Fluorescent timer” protein undergoes a slow conversion from green to red over time, and thus Timer-CVB3 can be utilized to detect virus infection and dissemination in real time. Upon infection with Timer-CVB3, partially differentiated neural progenitor and stem cells (NPSCs) and C2C12 cardiac myoblast cells released extracellular microvesicles containing viral material. Colocalization of viral and LC3 proteins in extracellular vesicles suggests that the autophagy pathway plays a role in microvesicle shedding. Purified exosomes isolated from the supernatants of Timer-CVB3-infected cells were positive for flotillin-1, LC3 and the viral capsid protein VP-1. These microvesicles encapsulating virus may be released in high numbers post differentiation and may play an important role in viral persistence and dissemination in the host. Clarifying the role of these microvesicles during CVB3 infection may be important for understanding virus immune evasion, and for developing new antiviral therapies and vaccines.

**129  10:00 am**

**Characterizing phenotypic properties of unexplored viral genes**

Daniel Cuevas, Bioinformatics and Medical Informatics (M)  
Rob Edwards, Computer Science

Viruses are the most abundant biological entity in the world. Although, genomes of viruses infecting bacteria (phage) lack extensive annotations and the majority of their genes are uncharacterized. This lack of information conceals the biological functions of these unknown genes and how they influence broader aspects of a host cell (e.g. the metabolic network of *Escherichia coli*). Here we present an experiment design alongside a unique software pipeline that has been developed by a group of students at SDSU to characterize the phenotypic changes of *E. coli* cells containing vectors of unknown viral genes. Using microarray plates to grow cells with combinations of viral genes and growth substrates, optical density readings are taken to measure bacterial cell abundance. The resulting data is evaluated through a software pipeline that models the cell’s growth. Logarithmic growth curves are calculated to characterize the growth level for each of the vectors, followed by statistical analyses and classification methods. With the expansive knowledge already available for *E. coli*, we will be able to leverage these new phenotypic observations to annotate uncharacterized viral genes.
which contained 100 bp-homologous DNA sequence before and after the Ig-like domain, and inserted a green fluorescence protein (GFP) sequence in the middle of the homologous region. After transforming the plasmid into wild-type Escherichia coli to generate the recombinant host (E. coli-GFP+), T3 phage particles were introduced to infect the host, enabling recombination between phage Ig-like domain and GFP located on the plasmid. PCR analysis showed the presence of recombination in phage liquid lysate after infection with E. coli-GFP+, but not in control phage particle without E. coli-GFP+ infection. PCR results indicate that the DNA recombination occurred during the phage infection, but whether the DNA was successfully packed into phage capsid still remains to be further verified. Ig-T3 phage particles will be tested for mucus adherence to confirm the role of this domain in mediating phage adherence to environmental surface. Overall, the modification of phage Ig-like domains will provide a powerful tool to investigate in vivo relationships between phage and host mucosal environments. Further applications exist for modifying other phage-adherence gene, and could therefore provide novel insights into phage-microbial community dynamics of other relevant environmental interfaces.

131  10:30 am

**Regulation of Tight Junction Complexes in Brain Endothelium by the Meningeal Pathogen, Group B Streptococcus**

Brandon Kim, Biology (D)
Kelly Doran, Biology

Bacterial meningitis is the most serious infection of the central nervous system (CNS) and if left untreated, is uniformly fatal. To cause meningitis, blood borne bacterial pathogens must interact with, and penetrate the blood-brain barrier (BBB), a specialized layer of microvascular endothelial cells that separates the brain from the blood. The BBB is an extremely tight barrier that regulates the flow of nutrients and molecules to maintain proper brain function. Previously we have identified a key molecular interaction between bacterial pili and a host integrin receptor, that is critical immune activation and disease progression. Interestingly, this identified receptor is found on the basolateral side of the polarized endothelium. To maintain polarity of the BBB, tight junction protein complexes act to separate apical membrane from basolateral membrane. These junctions are critical for BBB integrity and polarity. We have found that Group B Streptococcus (GBS) is able to disrupt the tight junction proteins ZO-1 and Occludin in brain endothelium. Furthermore we have identified that GBS upregulates a global repressor of tight junctions, SNAIL-1. By constructing overexpression cell lines we have found that SNAIL-1 is sufficient to disrupt tight junctions as well as increase permeability of the brain endothelium monolayer. Taken together, our data suggest a novel method of BBB disruption by GBS during disease. Further examination of the host cellular pathways and bacterial factors that contribute to SNAIL-1 upregulation are needed. Future studies will be aimed at creating a rescue effect of the barrier function by knocking down SNAIL-1 both in vitro and in a novel in vivo Zebrafish model of GBS infection.

Session A-6

**Oral Presentation:**

Graduate Research in Biochemistry
Friday, March 8, 2013, 9:00 am
Location: Library Addition 78

132  9:00 am

**Structure-activity studies of a peptide that inhibits DNA repair**

Gabriel Vahi-Ferguson, Biology (U)
Anca Segall, Biology

The Segall lab has previously identified peptides that have antibacterial activity, at least in part because they interfere with DNA repair processes. These peptides are being developed as tools to study recombination-dependent DNA repair in both prokaryotes and eukaryotes. The most potent peptide, WRWYCR, binds to the central DNA repair intermediate, the Holliday Junction (HJ), with high affinity and stability. Based on the fact that the active form of WRWYCR is a disulfide-bridged dimer, a dodecapeptide WRWYRGGRYWRW (L12), was synthesized and characterized and has also been shown to interact with the HJ intermediate. Three sequence variants of L12 were synthesized and these variant peptides were compared to L12 in order to determine the importance of different features of L12 to interactions with the HJ substrate. The peptide: HJ interaction was studied using two assays. First, we used a fluorescence-based assay that measured the interactions of the peptides with the HJ in solution. The results were analyzed using a mathematical model to predict the number of peptides bound to the center of the HJ. We also used a bandshift assay with which we experimentally determined the Kd of each peptide for the HJ. The results the two assays agreed with each other and indicated that the presence of a tryptophan at the C and at the N terminus of the peptide is important for the highest affinity binding and the lowest ratio of peptide to DNA substrate. These structure-activity relationship studies will help optimize the specificity of the interactions between the peptide and branched DNA repair intermediates.
133  9:15 am
Identification of new protein interactions of UNC-45, a myosin molecular chaperone, in Drosophila melanogaster
Carmen Carland, Cellular and Molecular Biology (M)
Sanford Bernstein, Biology
Molecular chaperones bind and stabilize proteins during folding and assembly, thereby insuring their proper function. UNC-45 is a molecular chaperone that plays an important role in folding of the protein myosin during stressful conditions. Myosins are key factors in cytokinesis, signal transduction and muscle contraction in many organisms. Improper folding and subsequent malfunction of myosin has been associated with cardiomyopathies and skeletal muscle disease. Besides binding myosin, UNC-45 also partners with heat-shock proteins such as HSP-90, with Apobec2 and with GATA transcription factor. This study seeks to uncover new interactions with Drosophila melanogaster UNC-45 through genetic deficiency screening in a sensitized background. We combined unc-45(+)/mutant heterozygotes with deficiency heterozygotes for individual segments of chromosomes 1 and 2. The resulting offspring were identified and selected for against dominant balancer markers. Organisms that carry a single copy of the unc-45 mutation as well as the deficiency in question served as our experimental group, whereas organisms that contain a single copy of the unc-45 mutation but lack the deficiency were used as controls. Thus far we have identified a deficiency region where the cross yielded greatly reduced viability (12 organisms) for double heterozygotes as compared to control heterozygotes (76 organisms). This region of interest runs from bands 22E1 through 22F3 on chromosome 2, encompassing twenty-two genes. To narrow down candidate genes encoding UNC-45 interacting proteins, we selected RNAi lines directed against eleven of these genes and crossed them with the unc-45 heterozygotes to test for lethal interactions. Once a candidate gene is identified for this and other regions of interest, its tissue-specific expression will be determined by RT-PCR and in situ hybridization. Pull-down assays and mass spectrometry will be used to verify interactions and to identify additional proteins that are interacting with UNC-45 during development and periods of stress. Findings from this study will aid our understanding of the mechanism of action of UNC-45 and its possible role in skeletal and cardiac muscle diseases.

134  9:30 am
Recognition of G-rich IRE sequence DNA by the NF-kappaB p50 homodimer
Ashlee King, Chemistry (M)
Tom Huxford, Chemistry
The expression of many innate immune response genes is regulated by both the nuclear factor κB (NF-κB) and interferon regulatory factor (IRF) families of transcription factors. Both families are characterized by conserved DNA binding domains. The DNA binding domain of NF-κB recognizes palindromic DNA sequences known as “κB sites” whereas the IRF DNA binding domain selectively binds IFN response element (IRE) DNA. The prototypical NF-κB is a heterodimer composed of one p50 and one RelA/p65 subunit. However, p50 homodimers are also prevalent in resting cells where they migrate to the nucleus and repress transcription of NF-κB target genes. As part of an effort to understand the function of the NF-κB p50 homodimer in immune responses, genome-wide studies were previously performed to determine its functional targets and further characterize the mechanism of DNA binding specificity. These studies determined that p50 binds to IREs that contain stretches guanine bases (G-IRE sites) and represses transcription of interferon response genes. These findings represent unexpected cross-regulation between NF-κB and IRF families of transcriptional regulators that coordinate the innate immune response. However, the precise manner by which p50 might recognize and bind to G-IRE sites is unknown. The goal of my research is to employ x-ray crystallography to generate a high resolution model of the p50 homodimer bound to a G-IRE site. I have expressed and purified NF-κB p50 homodimer using E. coli as a recombinant protein expression system. I have designed and purified a variety of DNA oligomers containing G-IRE sites. I am currently in the process of screening p50:G-IRE DNA complexes in order to obtain large, single complex co-crystals that can be used for x-ray diffraction experiments. Up to this point, I have grown crystals but they have shown very little or no diffraction in the x-ray experiments I have conducted. I am currently trying to optimize the crystals I have and screen new complexes to obtain diffraction data that can be used to build and refine a molecular model.

135  9:45 am
A Structural Basis for IkappaB Kinase Activation via Oligomerization Dependent trans Autophosphorylation
Arthur Hauenstein, Chemistry (D)
Tom Huxford, Chemistry/Biochemistry
First described in B-lymphocytes, the canonical NF-kappaB signaling pathway is a ubiquitous pro-inflammatory, cell survival program that can be activated by a diverse array of cytokines, growth factors, bacterial, viral, and environmental stimuli. In resting cells the transcription factor, NF-kappaB, is sequestered in the cytosol by its association with inhibitor of kappaB (IkappaB) proteins. Upon induction by extracellular stimuli, IkappaB is phosphorylated at two N-terminal serines which target it for ubiquitylation and subsequent proteolytic degradation. NF-kappaB is thus freed to translocate to the nucleus where it can enhance the transcription of a suite of target genes promoting cell growth and survival. The critical IkappaB phosphorylation event triggering NF-kappaB activation is performed by the inhibitor of kappaB
kinase (IKK) complex. The IKK complex is composed of two highly conserved catalytic subunits, IKKalpha or IKK1 and IKKbeta or IKK2, and a third essential, non-catalytic scaffolding subunit called IKKgamma or NEMO. Activation of the catalytic subunits involves phosphorylation of two activation loop serines (176 and 180 for IKK1 and 177 and 181 for IKK2). This requires NEMO in vivo to articulate upstream factors to IKK activation. In vitro, however, overexpression and purification of IKK2 alone can produce an active kinase. As such it is not clear whether an upstream IKK kinase such as TAK1 is always required for IKK activation and/or if the inherent trans-autophosphorylation activity of IKK plays a role.

In this study, we have crystallized and solved the x-ray structure of IKK2 in an active conformation. Analysis of the asymmetric unit reveals arrays of “open” IKK2 dimers associating through two novel protein-protein interfaces that appear to facilitate the positioning of kinase domains for efficient activation loop trans-autophosphorylation. Mutations of residues designed to abrogate these novel protein-protein interfaces reduce both the amount of S177,181 phosphorylation and N-terminal IkappaBalpha phosphorylation in HEK293 transfected cells. We also show that these higher order IKK2 oligomers exist in solution with sedimentation velocity and multi-angle light scattering experiments. We propose a mechanism of IKK2 trans-autophosphorylation by an oligomerization-dependent pathway through novel, transient protein-protein interactions. This would explain both the fast kinetics and signal amplification observed in cells.

136 10:00 am
Mechanism of General transcription factor association with the TATA box of U6 snRNA gene promoters
Jin Joo Kang, Chemistry and Biochemistry (D)
William Stumph, Chemistry and Biochemistry

Transcriptional initiation of U6 snRNAs by RNA polymerase III requires a conserved TATA box sequence. The TATA box is recognized by the TATA box binding protein (TBP). For recruitment and initiation of transcription by RNA polymerase III, TBP must associate with two additional proteins, Brf and Bdp, which together form the complete general transcription factor TFIIIB. The goal of my work is to examine the hypothesis that TBP, by binding to a TATA box, recruits Brf and Bdp to the DNA upstream and downstream of the TATA box. Thus, stable binding of TFIIIB to a U6 promoter would depend upon protein-protein interactions between TBP, Brf, and Bdp as well as interactions between all three subunits and the DNA. My work is designed to gather evidence to support these hypotheses, as well as to investigate whether there is a mandatory order of assembly of these factors into the protein-DNA complexes.

As an initial step, TBP, Brf, and Bdp were together co-overexpressed in Drosophila tissue culture cells. All three subunits were 6xHis–tagged and were co-purified by Ni²⁺ chelate chromatography. When used in EMSA (Electrophoretic Mobility Shift Assay) with the wild-type U6 promoter containing a TATA box, multiple shifted bands were observed; this suggests that a variety of stable protein-DNA complexes could be formed between the proteins and the DNA. All bands were super-shifted by addition of antibodies prepared against TBP. This indicates that all of the observed protein-DNA complexes contained TBP. Other shifted bands were selectively super-shifted when antibodies against Brf or Bdp were added to the EMSA incubations, suggesting the presence of Brf or Bdp or both in specific complexes with the DNA and TBP. Although further work (including the pair-wise mixing of individually-expressed proteins) will be required to definitively identify these complexes and the subunits they contain, this work suggests that TBP-DNA, TBP-Brf, and TBP-Bdp interactions are required for the assembly of these complexes on the DNA.

Session A-7
Oral Presentation: Evolutionary Biology I
Friday, March 8, 2013, 9:00 am
Location: Library Addition 76

137 9:00 am
Genetic species delimitation and species tree inference in the Sitalcina sura species group (Opiliones, Laniatores)
Angela Didomenico, Evolutionary Biology (M)
Marshal Hedin, Biology

California is home to numerous endemic harvestmen (Arachnida, Opiliones), including members of the genus Sitalcina. The Sitalcina sura group is ideal for testing species limits because these dispersal-limited arachnids show minimal gene flow between populations, which typically results in many genetically distinct endemic populations. Prior to this study, very limited genetic data was available for Sitalcina species and previous studies focused only on broad relationships of taxa within the genus, not closely related species. Here, molecular phylogenetic and species delimitation analyses will be conducted including all species in the S. sura group. In addition to the eight currently described species, we have discovered four possible new species. For each species in the S. sura group, genetic species delimitation should provide the framework needed for
determining species limits as well as the operational taxonomic units. Also, phylogenetic analyses including all members of the *S. sura* group will be used to examine evolutionary relationships and biogeographic structure. Species delimitation will be accomplished using the program BP&P, which uses reverse-jump MCMC (rJCMC). Species trees will be reconstructed using multispecies coalescent methods implemented in *BEAST.* Preliminary genetic analyses using DNA sequence data from 3 genes delimit 8 species in the *S. sura* group, although results may be biased indicating the need for more comprehensive genetic sampling. Also, molecular phylogenetic evidence reveals distinctive genetic groupings between species residing in desert versus those in coastal habitats. The study and classification of these rare arachnids is an important project to undertake for evolutionary, biogeographic, and conservation purposes. Conservation may be an important issue for several species within the *S. sura* group given their restricted endemic distributions, and defining operational taxonomic units will help aid conservation efforts.

138  9:15 am

*The phylogeography of the Sidewinder (Crotalus cerastes) using relaxed clock phylogenetics*

John Andermann, Evolutionary Biology (M)
Tod Reeder, Biology

*Crotalus cerastes,* commonly known as the Sidewinder, is an emblematic species of rattlesnake endemic to deserts of the southwestern US and northwestern Mexico. Thus, mitochondrial DNA sequence data collected from specimens throughout the range of *C. cerastes* can reveal clues to answer questions relating to the historical biogeography of these desert regions. To address these questions, we used Bayesian inference in order to examine the phylogeographic structure within *C. cerastes* based on the mitochondrial NADH dehydrogenase 1 (ND1) gene region. Using a relaxed molecular clock, chronophylogenetic analyses were conducted by assigning a known nucleotide substitution. This molecular divergence dating method is a useful alternative for estimating divergence times for organisms without available fossil calibrations. Here, we apply a rate of nucleotide substitutions per site per million years that has been used in other recent divergence dating studies of other squamates reptiles. The estimated relative dates of divergence among clades of *C. cerastes* have important biogeographic implications for these regions relating to geological and climatological processes during the Pliocene and Pleistocene that are likely responsible for phylogeographic diversification in *C. cerastes.* These results allow us to test hypotheses concerning the phylogeographic history of *C. cerastes* put forth by others, some of which used less extensive population sampling and inappropriate/out-dated methods. Our results thus far support the existence of the following regional clades: Colorado Desert, Sonoran Desert, south Mojave Desert, and north Mojave Desert.

139  9:30 am

*Multilocus Species Delimitation and Species Tree Inferences Within the Western Rattlesnake Species Complex*

Julianne Goldenberg, Biology (M)
Tod Reeder, Biology

The past few years have brought about a renaissance in the development of coalescent-based species tree inference methods that utilize information from multiple genes; however in order to implement such methods it is necessary to designate sampled individuals to defined species/populations beforehand. This is problematic for groups where species limits are viewed as contentious or uncertain. To avoid convoluting the concept of a species to any greater extent, objective and broadly applicable methods of species delimitation are prerequisite to applying multilocus phylogenetic methods to such evolutionary groups. Here we demonstrate a novel method of concomitant species delimitation and species tree inference via a Bayesian model-testing approach. Our method does not require that we assume either species designations or a guide tree. As previous studies have yet to establish either of these within the Western Rattlesnake (*Crotalus viridis*) species complex, this group is an ideal candidate for demonstrating our method. The rattlesnakes of the *C. viridis* species complex (currently *C. viridis, C. cerberus,* and *C. oreganus*) have the most extensive distribution of any venomous reptile in North America, ranging from southern Canada to northern Mexico and from the Pacific Coast to the midwestern United States. Historically, and until relatively recently, the polytypic *C. viridis* complex included as many as nine geographically and morphologically distinct subspecies contained within the single inclusive species *C. viridis.* Attempts to infer the evolutionary relationships within this complex have resulted in controversial and contradictory taxonomic recommendations, and despite these efforts an understanding of the phylogeny remains a source of contention. Using DNA sequence data from five nuclear genes and one mitochondrial gene, we apply our method to estimate the species limits and infer the species tree of the *C. viridis* complex. Our results indicate that *C. oreganus* is likely comprised of multiple species, warranting possible taxonomic revision within the *C. viridis* species complex.

140  9:45 am

*Can you hear me now? Form and function in whale earbones*

William Ary, Biology (M)
Annalis Berta, Biology

Toothed whales (odontocetes) have a sound reception apparatus that is specialized for underwater hearing and works in tandem with their biosonar system. The apparatus is composed of the internal acoustic pinnae and the bony tympanoperiotic complex (TPC). The internal pinnae are made of special acoustic fats and other tissues that form a waveguide, bringing sounds from the
environment to the TPC, which contains the middle ear bones. The sound reception apparatus functions to filter and/or amplify incoming sounds depending on the utility to the animal. Across species, odontocete TPCs have a variety of shapes. These shapes are linked to function. We CT scanned TPCs from 8 species across the Odontoceti. Geometric Morphometrics techniques characterized the shapes of the TPC’s. Vibrational analysis, based on finite element models, provided a family of “natural” or resonant frequencies for each TPC. These resonant frequencies provide insight into the animals’ sense of hearing and the potential effects of anthropogenic sound.

Session A-12
Poster: Microbiology I
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

141 Poster #1 9:00-10:45 am
Optical Bacterial Growth Sensor Based on Ultrathin Iron Oxide Films
Dominic Goria, Biology (U)
Gregory Kalyuzhny, Chemistry

We propose a novel method for the screening of bacterial presence. Through this method, bacterial growth may be measured by calculating the extent to which microbial organisms consume an ultrathin iron oxide film in an iron-deficient environment via spectrophotometric readings. Bacterial growth is commonly measured by the presence of turbidity in the growth medium. The drawbacks of this method are long analysis time and low sensitivity. Our technique utilizes inexpensive reagents, custom laboratory equipment, and acquired results within hours. Preliminary testing demonstrated that considerable changes in light transmission were detected long before cell density analysis by turbidity produced significant results. Possible consumer markets for our product may be within pharmaceutical, hospital, and medical industries.

The ultrathin iron oxide film is prepared by heating the precursor compound iron trisbipyridine tetrafluoroborate, which is synthesized by reacting iron(II) chloride with disodium carbonate to induce the formation of iron(II) carbonate; which is then dissolved in tetrafluoroboric acid. The mixture is further reacted with three equivalents of bipyridine and is purified and recrystallized twice. This synthetic derivative is redissolved and distributed over a glass slide via spin coating techniques and gradually heated to 550° Celsius. These iron oxide films are then placed in iron deficient media with a specific bacterium for a predetermined amount of time. A spectrophotometer is used to measure degradation of the iron oxide film. By utilizing tissue culture plates, and rounded glasses slides; one may be able to measure absorbance readings on multiple samples simultaneously. This also allows sensitive measurement of bacterial growth kinetics. Further testing and enhancement of our technology may improve its application as a biosensor for bacterial presence. Its use of commonplace devices allows relatively inexpensive employment into various laboratories. Early growth rate detection and sensitive measurement of bacterial growth rate kinetics may be of substantial benefit to possible consumers.

142 Poster #2 9:00-10:45 am
Microbial Database
Dwaine Smith, Biology (U)
Robert Edwards, Computer Science

Technological advances in genetic research have enabled scientists to sequence and study microbial genomes. Microbial genomes provide information about specific proteins, how these specific proteins function, and how these proteins are regulated to mechanistically maintain a functioning organism. There is, however, a lack of phenotypic information for the genomes. Phenotypic information includes: optimum pH, as well as maximum, minimum, and optimal growth temperatures at which the organisms live.

Creating a database that will collect and combine phenotypic microbial data that can be utilized and accessed in a computer consumable format may help to expand the microbial genomic databases. Currently, select sets of organisms have been targeted to begin populating our database with phenotypic data in order to eventually stream-line our acquisition of data. The proposed database may provide bioinformaticians access to phenotypic data that may, in turn, help formulate correlations between genotypic and phenotypic characteristics.

143 Poster #3 9:00-10:45 am
Characterizing unknown genes through metabolomics
Tiffany Liang, Bioinformatics and Biomedical Informatics (M)
Robert Edwards, Computer Science and Biology

Viruses are thought to be the most diverse biological entities on earth. However, they are also the least characterized regarding their genetic, taxonomic, and functional diversity. In metagenomic analyses of viral communities from various environments, most sequences are unrelated to any known sequences. About 90% of the viral sequences found in marine environments are unknown. The goal of this study is to characterize the function of unknown viral genes that alter host metabolism.

Open reading frames were predicted from the metagenomes and genes synthesized and cloned into E. coli [everyone knows E. coli]. The metabolites produced by the bacterial clones are then identified by gas chromatography-coupled time-of-flight (GC/TOF) mass spectrometry. In total 551 metabolites were found, however 84% of them were not identified based on their mass.
We are identifying the specific metabolites produced or affected by the over expression of phage proteins to suggest the physiological roles for these proteins that could be tested experimentally. We are building a systematic analysis tool that can process any kind of metabonomics data for downstream analysis of metabolomics and related data sets.

144 Poster #4 9:00-10:45 am

In Search of a Genetic Explanation for Drug Resistance in Mycobacterium Tuberculosis (Mtb)

Victoria Zadorozhny, Bioinformatics (M)
Faramarz Valafar, Bioinformatics

The incidence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) tuberculosis (TB) has been steadily increasing worldwide. The availability of rapid and reliable methods for the detection of drug resistance is vital for successful treatment of the disease. In this project we study the resistance to seven first and second line drugs: isoniazid (INH), rifampicin (RIF), amikacin (AMK), capreomycin (CAP), kanamycin (KAN), and two from the fluoroquinolone group of drugs, oxifloxacin (OFX) and moxifloxacin (MOX). In this study, over 400 Mtb isolates were collected from four countries with a high TB burden: India, Moldova, Philippines, and South Africa. These isolates were sequenced with three different technologies: Sanger, Pyrosequencing, and Pacific Biosciences for whole genome sequencing. Sanger sequencing was done on small regions of eight genes/promoter regions also known as “hot spots”: katG, inhA promoter, rpoB, rrs, tlyA, eis promoter, gyrA and gyrB. These hot spots are known to be associated with resistance to the seven antibiotics listed. Mutations in katG and inhA promoter were found to be associated with resistance to INH; mutations in rrs were found to be associated with resistance to CAP; mutations in rrs and eis promoter were found to be associated with resistance to AMK and KAN; mutations in gyrA were found to be associated with resistance to OFX and MOX; mutations in rpoB were found to be associated with resistance to RIF. Ten percent of resistant TB isolates in this dataset have no mutations in the “hot spot” regions, highlighting the need to study other regions of the genome for the genetic explanation of these resistant cases. Whole genome sequencing will be used to help in identifying novel genome-wide mutations that may offer a more complete view of the mechanisms of drug resistance for these seven drugs.

145 Poster #5 9:00-10:45 am

Cancer Biomarkers

Laura Buehning, Public Health (M)
Zohir Chowdhury, Graduate School of Public Health

BACKGROUND Endobiogeny is a system of clinical evaluation that studies how the endocrine system manages the terrain of the organism. The biology of functions (BoF) is a biological modeling system based on the theory of endobiogeny. This system evaluates the physiology of an individual based on seventeen serum biomarkers. From these 17 biomarkers, a series of over 100 indices are derived which reflect the functional metabolic state. The BoF is an integrated, dynamic assessment of human physiology and therefore it is well suited to describe complex, multi-factorial activities within the body, such as cancer.

METHODS A retrospective case control study was performed using the BoF analyses of 46 patients with a history of cancer and 46 age and sex matched controls. The analysis included 62 of the BoF parameters. The data was analyzed with the Wilcoxon Signed Ranks Test using SPSS software. RESULTS The data showed a statistically significant difference between all cancer patients and controls for seven of the BoF indices. These indices are the genitothyroid index, the comparative genital androgeny index, the estrogen fraction index, the index of thyroid metabolic activity, the beta melanocyte stimulating hormone (MSH) to alpha MSH index, the catabolism to anabolism index, and the proinflammatory index. CONCLUSIONS Statistical associations were found between cancer and seven biomarkers of the BoF system in this small case control study. These results warrant further study of this system in cancer patients and other types of chronic disease.

The assessment system could assist in the clinical evaluation and management of chronic diseases. PUBLIC HEALTH IMPLICATIONS The BoF indices could be beneficial for early cancer detection, screening and prevention. They could also be beneficial in monitoring the effectiveness of cancer therapies. The ability to identify and evaluate cancer activity and its response to treatment using simple blood tests would be a valuable addition to the prevention and clinical management of cancer.

146 Poster #6 9:00-10:45 am

Waist to hip ratios predict odor recognition memory processing speed in carriers of the Apolipoprotein ε4 allele

Melissa Cervantez, Psychology (M)
Claire Murphy, Psychology

The ε4 allele of Apolipoprotein E (ApoE ε4) is currently the strongest genetic risk factor associated with Alzheimer’s disease (AD). Studies have linked the ε4 allele with olfactory decline. Previous research has also found that waist to hip ratios predict olfactory event-related potential (OERP) latencies among ε4+ individuals at the P3 cognitive component. The current study aimed to measure OERPs among ε4+ and ε4- individuals as they completed an odor recognition memory task and to determine whether the waist to hip ratio can predict the latency of the N1 sensory component of the OERP waveform. OERPs were recorded from the FZ, CZ, and PZ midline scalp electrode sites in 60 participants (30 F, 30 M, mean = 46.88 years) with an equal number of ε4+ and ε4- individuals. The odors were presented by a computer-controlled olfactometer. Participants were instructed that they were performing a memory task and completed three sessions: session 1 was an exposure trial for encoding, session
2 was a retrieval trial using odors, and session 3 was a retrieval trial using odor labels. Using a bivariate correlation analysis, results indicated a significant positive correlation between waist to hip ratio and N1 latency during odor retrieval hits for the FZ, CZ, and PZ electrode sites ($r = .358, p = .006$; $r = .352, p = .007$; $r = .334, p = .010$). When ApoE ε4 allele status was examined separately, the positive correlation remained significant for ε4+ individuals ($r = .439, p = .015$; $r = .423, p = .020$; $r = .425, p = .019$) but not for ε4- individuals. The results suggest that latency of the N1 OERP component during retrieval of an odor recognition memory task may be a useful measure for examining the negative effects of high waist to hip ratios in those genetically at risk for AD.

### Session A-13

**Poster: Chemisty I**

**Poster #7 9:00-10:45 am**

*Development of an in vitro functional assay for myosin folding by the UNC-45 chaperone protein*

Catherine Aviati, Biology (U)
Tom Huxford, Chemistry and Biochemistry

UCS proteins, named for their conserved UCS domains, are found in a wide variety of organisms. The charter members of this protein family are UNC-45 found in *C. elegans* and other eukaryotes, Cro1p from the filamentous fungus *P. anserina*, and Shep4 in *S. cerevisiae*. Many years of genetics research suggests that UCS proteins are necessary for proper folding of the myosin globular head, which is required for ATP-dependent actin-facilitated motor function. While a growing body of biochemical evidence supports this claim indirectly, direct observation and measurement of the ability of UNC-45 to restore motor function of unfolded myosin has not been reported. This goal of this research is the design and implementation of a novel in vitro biochemical assay of UNC-45-dependent restoration of myosin function. The assay utilizes histidine-tagged indirect flight muscle myosin isolated from a transgenic Drosophila melanogaster strain and purified by affinity and size exclusion chromatography. The six histidine residues on the N-terminus of the protein allows for its adherence to 96-well nickel coated plates, which has been proven to occur via western blot after several optimization experiments. Additionally, molecular cloning, protein expression, and protein purification has been successfully performed in order to obtain an isoform of UNC-45 which does not contain a histidine tag, but rather a GST tag, as the tethering of this particular protein to the nickel coated plate via histidine tag may interfere with possible protein-protein interactions. In the presence of filamentous actin and ATP, ATP hydrolysis should occur, given that the myosin motor head is intact. ATP hydrolysis can be measured via the production of ADP using luminescence. In the event of myosin motor head denaturation via prolonged ATP hydrolysis, a noted decrease in ADP production should be observed. We hypothesize that the introduction of UNC-45 to denatured myosin will be marked by an increase in ATP hydrolysis, indicative of restored myosin motor head function. Successful implementation of the in vitro assay will enable future structure-based assignment of function to specific domains, loops, and individual amino acid residues of the UNC-45 protein.

**147 Poster #8 9:00-10:45 am**

*Electrochemical Studies of possible new drugs to treat Chagas Disease*

Ramsis Ramsis, Chemistry (U)
Diana Smith, Chemistry

The protozoan parasite, *Trypanosoma cruzi*, is commonly treated with benznidazole. It is believed that benznidazole is activated in vivo by the reduction of the 2-nitroimidazole ring at the core, resulting in a toxic free radical that provides antimicrobial activity due to *T. Cruzi* lacking detoxifying activity, making it more sensitive than human cells (Molina, et al 2009). In order to counter benznidazole strains of *T. Cruzi*, triazoles are being investigated as possible new drugs due to there exceptional activity against *T. Cruzi* (Guedes, et al 2004). In this work, the ease of reduction of the 3-nitrotriazole is being characterized by using cyclic voltammetry to measure the half-wave potential (E1/2) for their reversible one electron reduction in acetonitrile (Eq. 1).

**149 Poster #9 9:00-10:45 am**

*Stereospecific synthesis of Lagunamide A*

Maxfield Fröhlich, Biology (U)
Mikael Bergdahl, Chemistry

Emerging strains of multi-drug resistant malarial cell lines poses new challenges to 21st century medicine. Current treatment of *Plasmodium falciparum* involves modifications of medicines that act via similar enzymatic pathways. Medicines with novel mechanisms provide the most potential in the development of new and efficient treatments. The lagunamides have demonstrated promise in the treatment of malaria by displaying cytotoxic effects to *P. falciparum* in vitro, in addition to displaying anti-swarming activity in infected human erythrocytes. IC50 values of 0.19, 0.24, and 0.91 μM reported in Lagunamide A, B, and C respectively, suggest stereospecific modifications to carbons 40–44 may lead to the development of stronger therapeutic agents, although the enzymatic binding-mechanism remains unknown. Interestingly, the lagunamides also show promise in the treatment of murine P388 leukemic cell lines, showing IC50 values of (2.1– IC50 6.4), 20.5, 4.5 nM for A, B, and C, respectively. Efficient synthesis is necessary in providing materials for biochemical testing and eventually
clinical evaluation. We designed a convergent synthetic approach to establish 5 of the 10 stereocenters present in the molecular structure of Lagunamide A. These intermediates were confirmed using NMR, crystallography, optical rotations, and LCMS. The development of stereospecific intermediates allows versatility in the development of Lagunamide analogues, which will enable SAR studies to determine the stereocenters that may be modified to enhance lagunamide’s effectiveness as a therapeutic agent. Our convergent synthetic approach of Lagunamide A will establish a platform from which B, C, and other analogues can be easily constructed to benefit the field of chemical biology. This work is crucial in creating tunable, more potent agents against malaria and cancer. The Bergdahl group is proposing a synthesis that is highly optimized, providing significantly higher overall yields and greater selectivity, an imperative feature for clinical testing.

Index Terms—Lagunamide A, Lagunamide B, Lagunamide C, P388 cell lines, Lagunamide analogues.

**150 Poster #10 9:00-10:45 am**

**Supramolecular Assembly using Organic Radical Pi Dimers. Measurement of Dimerization constants using UV-vis Spectroscopy**

Shaminee Keenawinna, Chemistry (U)  
Diana Smith, Chemistry

The overall goal of this project is to determine whether the well-known tendency of stable organic dye radicals to form pi-stacked dimers in aqueous solution can be utilized as a means to build ordered supramolecular structures in aqueous solution. In order to do this a convenient method for measuring the equilibrium constant for dimerization of these radicals needs to be developed. The specific goal of this work is to develop such a method for the methyliogen radical cation, which is formed by one electron reduction of methyl viologen, MV$_{2}$$^{2+}$. It should be possible to determine the dimerization constant by analyzing UV-vis spectra of the radical taken at different concentrations. The main challenge is that the radical is very oxygen sensitive, so it must be generated and transferred to the spectrometer in the absence of air. During the past semester a number of methods were tried to accomplish this: reduction of MV$_{2}$$^{2+}$ using sodium dithionite followed by transfer to the spectrometer cell using a syringe, electrochemical reduction of MV$_{2}$$^{2+}$ directly in a thin layer UV-vis cell, and, finally, reduction of MV$_{2}$$^{2+}$ using Zn with transfer of the radical solution through stainless steel tubing into a UV-vis flow cell. None of these methods proved reliable. Currently, bulk electrolysis using a Hg electrode coupled with the UV-vis flow cell is being explored. Once a method is determined that allows UV-vis spectra to be recorded of MV$_{2}$$^{2+}$ solutions that have been reduced to the radical without over reduction or under reduction due to air oxidation, concentration-dependent UV-vis spectra of the radical will be recorded and the data analyzed to determine the dimerization constant under our experimental conditions.

**151 Poster #11 9:00-10:45 am**

**Does the Antibiotic Virginiamycin S1 Have Different Conformations When Dissolved in Different Solvents**

Sarah Jane Ferrer, Chemistry, emphasis in Biochemistry (U)  
Robert Metzger, Chemistry

Virginiamycin, an antibiotic obtained from *Streptomyces virginiae*, consists of two different molecules, Virginiamycin M1 (VM1) and virginiamycin VS1. By binding to specific parts of the 23S rRNA of the 50s ribosome, VM1 and VS1 synergistically obliterate susceptible bacterial species by inhibiting the microbial protein synthesis (1-3). Both molecules are more soluble in non-polar liquids and dissolve poorly in water. VM1 has been found to have different three dimensional conformations when dissolved in liquids with different polarities and it is proposed that this molecular flexibility is the reason for VM1’s effectiveness (4, 5). We now report the results of a study designed to show if VS1 also has different conformations when dissolved in liquids of different polarities by use of 2 dimensional nuclear magnetic resonance (NMR) methods. VM1 and VS1 were extracted and purified from pig feed as previously described (6), followed by extensive filtration and silica gel column methods to purify both compounds. To study VS1 conformation in different solvents, pure VS1 was dissolved in deuterated solvents and placed into NMR tubes in order to obtain NMR spectra. The deuterated solvents used, in order of increasing polarity, were chloroform, dimethylsulfoxide, methanol, and D$_{2}$O. 1 dimensional H and C NMR spectra and COSY, HMQC and NOESY 2-dimensional NMR spectra were obtained. The 2 dimensional NMR techniques, in particular NOESY, are used to determine the conformation of the molecule. We will discuss the NMR spectra of VS1 in deuterated dimethylsulfoxide and deuterated chloroform.

**152 Poster #12 9:00-10:45 am**

**Sensitive Analysis of Neurotransmitters by Laser Wave-Mixing Spectroscopy and Capillary Electrophoresis**

Linda Honaker, Chemistry/Biochemistry (U)  
William Tong, Chemistry & Biochemistry

Hypothesis: Variations in the concentrations of amino-acid neurotransmitters in biological fluids have been implicated in numerous neurological disorders. Examination of these neurotransmitters may present a method to diagnose and possibly treat these neurological disorders. In order to assess the low levels of neurotransmitters in biological fluids, sensitive and specific detection methods are needed. In this work, we explore the use of nonlinear multi-photon laser wave-mixing spectroscopy as an ultrasensitive detection method for the analysis of amino-acid neurotransmitters, including glutamate, aspartate, γ-aminobutyric acid and serotonin. Methods: In our wave-mixing setup, two laser beams are focused and mixed inside a capillary flow cell, which contains the analyte. The mixing
laser beams create interference gratings, which interact with the analyte to form unique thermal gratings. Subsequent photons diffract off these gratings to produce two coherent laser-like signal beams that can be collected efficiently and with minimal background levels. The signal has a quadratic dependence on absorption coefficient and a cubic dependence on laser power. Separation methods such as capillary electrophoresis can be coupled to the laser wave-mixing detector efficiently, allowing for the identification of specific biomolecules in a complex bio cell or sample. Results: We have demonstrated laser wave mixing to be a versatile and sensitive detection method. Unlike fluorescence-based methods, our method can detect biomolecules either in their native form or labeled with a chromophore because it is an absorption-based optical detection method. We could detect label-free serotonin using an ultraviolet laser, or labeled with fluorescein using a 473 nm laser. Our preliminary results show nanomolar detection levels for chromophores and fluorophores with low background noise and excellent signal-to-noise ratios. Conclusion: Laser wave mixing offers advantages over conventional detection methods including parts-per-quadrillion level detection sensitivity, small sample requirements, portable and rugged designs, and high spatial resolution. Potential applications include sensitive and specific detection of biomarkers for early-stage disease detection and diagnosis.

153  Poster #13  9:00-10:45 am

**Analysis of the Reduction of 1,2-Dimethyl-5-nitroimidazole Using Cyclic Voltammetry**

Karen An Ronquillo, Biochemistry (U)

Diana Smith, Chemistry

Diseases caused by microorganisms such as Giardia and Amoebiasis plague developing countries due to polluted water. Nitroimidazoles are known to be effective components of medications for such diseases. However, it is assumed that the behavior and reactivity of all nitroimidazoles are identical. The objective of this project is to test this assumption, through experiments with 1,2-Dimethyl-5-nitroimidazole. Furthermore, we aim to understand all components of the reaction pathway of this compound through cyclic voltammetry. Resulting cyclic voltammograms, or CV's, are compared with CV's of other nitroimidazoles. Following the reactivity of the nitroimidazole requires analysis of the reversibility, intensity and identity of each reduction and oxidation peak on the CV. Additional voltammograms were produced in which hydroxide and nitrite were separately added to the nitroimidazole for further identification of peaks. From comparison of the CV's of other nitroimidazoles to CV's of 1,2-Dimethyl-5-nitroimidazole, it is evident that the reaction pathways vary, disproving the earlier stated assumption. Experiments in which hydroxide was added to the nitroimidazole have eliminated hydroxide as one of the products of the reduction of the imidazole. Similarly, experiments that involved the addition of nitrite to the nitroimidazole eliminated nitrite as a possible product. Since the behavior of 1,2-Dimethyl-5-nitroimidazole deviates from previously tested nitroimidazoles, it is necessary to examine the reactions of more types of nitroimidazoles. Knowing the reaction pathways will aid in the development of new nitroimidazole-based drugs.
of the surveyed participants were aware, with slightly more than half having their blood pressure levels controlled by prescribed antihypertensive medication. Data collected from this population shows that hypertensive individuals tend to be more sedentary, particularly in terms of watching more TV and walking less per day. This study indicates that hypertensives need more physical activity in their daily life to control and prevent their blood pressure.

155 Poster #15 9:00-10:45 am

A Kinematic Analysis of Chewing in Children with Cerebral Palsy
Lucia Kearney, Speech, Language, & Hearing Sciences (U)
Ignatius Nip, Speech, Language and Hearing Sciences

Cerebral Palsy (CP) is a movement disorder that affects numerous aspects of an individual's daily functioning, including impaired feeding and chewing skills. Previous studies have found that children with CP were introduced to solids in their diets at a later age, and also took longer when chewing foods with solid textures. They also exhibited more coughing and choking during mealtime, and poorer oral-facial motor control than their typically developing peers. Although we know children with CP to exhibit chewing and feeding difficulties, the nature of the chewing impairment has yet to be examined. Therefore, the purpose of the current study is to explore how the movement characteristics of chewing in children with CP compare to those of typically-developing peers. We hypothesize that children with CP will have longer duration of chewing, slower speed of jaw movement, and will have a greater path distance of movement.

Chewing data were recorded using an 8-camera optical motion capture system. Data analysis will include kinematic measurements (duration, jaw speed, jaw path distance) to determine the movements of chewing in children with CP, and their typically-developing peers. We will use data from 6 children with a CP diagnosis, and 6 typically developing peers, ranging in age from 5 to 10 years, who were fed a teaspoon of three different consistencies: solid (Cheerios), mechanical soft (bananas), and puree (applesauce). Each performed a minimum of five trials per consistency. The data have already been collected and analysis is currently underway. Mann-Whitney U tests will be conducted to determine if the kinematic variables for chewing in children with CP are significantly different from their typically developing peers.

Further understanding of how the disorder affects chewing movements will provide us with additional insights into how this disorder affects orofacial control which is needed for speech and feeding. This information will potentially contribute to future treatment protocols that will help children with CP improve their feeding skills.

156 Poster #16 9:00-10:45 am

Developing an assay for modeling psychiatric disorders in vivo
Anna Tarabrina, Kinesiology (U)
Krishnan Padmanabhan, Salk Institute

Many psychiatric disorders, including schizophrenia and autism spectrum disorders, present problems for investigation due to the difficulty of generating animal models that reflect the complex pathological, molecular, and genetic changes underlying the disorders. Murine models that target certain genes associated with these disorders have several downsides. The problems with animal models that target single gene may include: 1) some knockdown mice models are not viable, 2) altered gene is not the sole cause of the disorder, or if it is it represents just the first alteration from which other pathologies arise that could not be modeled by a single gene approach. The development of stem cell technology, including inducible pluripotent stem cells (iPSCs) isolated from patients has allowed progress to be made addressing the genetic causes of the disease. However, these approaches are not applicable for studying neuronal circuits.

This project proposes to develop an assay for studying human disease in mouse model systems by engrafting (transplanting) stem cells including neuronal precursor cells (NPCs) into the mouse and characterizing how they mature and integrate into existing circuits.

This project is the first step in establishing a transplantation assay for NPCs into three different areas of the brain and then following this with examination and characterization of the possible neuronal differentiation and migration of transplanted NPCs. Preliminary data demonstrates that engrafted human NPCs can be successfully transplanted into the olfactory bulb and the cortex areas of the mouse brain. Transplanted human NPCs survived and differentiated into Tuj-1 (neuronal marker) positive cells. NPC survival was highly variable ranging from few cells per engraft to hundreds of cells.

157 Poster #17 9:00-10:45 am

Nutritional Health Status of Homeless Veterans in San Diego
Maricris Cruz, Nursing (U)
Young-Shin Lee, Nursing

Nutrition is a common indicator of a person’s overall health. Malnutrition or undernutrition is associated with an increased risk of morbidity and mortality, and it has been found to have a variety of detrimental effects in the body’s function. The purpose of this cross-sectional, descriptive study is to describe the nutritional health of homeless veterans in San Diego. More specifically, to 1) examine the association of their nutritional status with their demographics, social and physical activities, and number of
ABSTRACTS

Nutritional risk scores were based on sum of the numbers that correspond to each question; higher scores mean higher nutritional risk. Descriptive statistics, bivariate correlation, and ANOVA were applied for analysis. Seventy-five percent of the participants had high nutritional risk. Raw data showed that more males than females, those who lived alone, and have insufficient income, had higher nutritional risks. However, ANOVA results showed no significance among the selected measures to the individuals’ nutritional risks. Significance was found between the questions and the total score of the nutritional assessment scores. The questions that significantly contributed to the high nutritional risks were: 1) inability to eat more than two meals a day and 2) financial inadequacy; followed by conditions that changed their diet, dentition problems, more than three over-the-counter medications, unintentional weight loss, and inability to prepare their own meals. Overall homeless veterans’ nutritional risks were high related to the reasons mentioned above. Validity of the results was limited by the small sample size and unique setting. However, it opens up opportunities for further studies on the nutritional status of the homeless veterans.

Association of Physical Activity and Life Satisfaction to Health-Related Quality of Life in Hodgkin Lymphoma Survivors, Behavioral Risk Factor Surveillance System, 2009

Alexandria Blacker, Public Health (M)
Caroline Macera, Graduate School of Public Health

Introduction: Hodgkin Lymphoma has about an 85% 5-year survival rate with many survivors living well past 40 years post-diagnosis, allowing for an extended period for late effects of treatment to develop including depression, fatigue and anxiety, which can influence health and well-being. This cross-sectional study assessed the association between physical activity and health-related quality of life in Hodgkin Lymphoma survivors. It also considered the influence of psychosocial factors and age at diagnosis on health-related quality of life. Methods: The population of 365 Hodgkin Lymphoma survivors was gathered from the 2009 Behavioral Risk Factor Surveillance System. Health-related quality of life was measured using the Health Days measures. Controlling for socioeconomic, demographics, and co-morbidities, an adjusted multivariate logistic regression model was used to determine the association between physical activity, psychosocial factors, age at diagnosis and health-related quality of life among survivors. Results: Compared to physically active survivors, those who are physically inactive reported more frequent activity limitation (Odds Ratio [OR] 10.8) and physical distress (OR 4.2) Survivors who were dissatisfied or very satisfied with life presented greater odds for frequent activity limitation (OR 14.7), physical distress (OR 9.7), mental distress (OR 24.2), and unhealthy days (OR 33.1) compared with those who were satisfied with life. Conclusion: Physical inactivity and life dissatisfaction are associated with poorer health-related quality of life in this population of Hodgkin Lymphoma survivors, which may suggest the need for an increase in physical activity and life satisfaction programs in long-term cancer survivorship plans.

Scald burns presenting at South African Hospitals

Ashley Gevaart-Durkin, Public Health (M)
Zohir Chowdhury, Graduate School of Public Health

Burns are responsible for an alarming number of deaths worldwide each year. Children, particularly under the age of two, are particularly susceptible to burn injuries due to their curiosity, unawareness of danger, still developing motor skills, and frequent neglect; this makes burns the 11th leading cause of death among children aged 1-9, in the world. According to the World Health Organization (WHO), approximately 75% of burns to kids are a result of hot-liquids. The aims of this study are to identify the demographic profile of scald burn patients, investigate injury location and severity of burns, and analyze data for trends in scald injuries incidence. Patients presenting with scald burns at fourteen hospitals throughout South Africa were interviewed with a questionnaire and descriptive analysis was done using Microsoft Excel. Data were collected from participating hospitals over a six-year period of time. In total, 2,720 scald burns were treated, representing 53% of all burns treated. Scald burns are more common in boys and among young children, aged 1-2. Scald injuries are mostly commonly sustained in the home while playing (45%). The face was the most common area of the body burnt, most received burns to 3-5% of their body, and 60% of them were categorized as superficial in depth. It is alarming that scald burns are so prevalent in South Africa since these types of burns are largely preventable by placing hot liquids out of reach of young children, as well as alleviating poverty, which leads to lack of supervision by parents, putting children at greater risk of injury. This type of data is helpful in informing intervention types in low socioeconomic areas of the world and in affecting policy.
Case study on the feasibility of using a low-cost device to track balance ability in an individual with multiple sclerosis
Brian Cone, Kinesiology/Rehabilitation Science (M)
Daniel Goble, Exercise and Nutritional Sciences

Background: Balance plays a critical role in a person’s ability to perform activities of daily living. Multiple Sclerosis (MS) is a debilitating, autoimmune disease that impairs the central nervous system by attacking the myelin sheaths that protects the nerve fibers in both the brain and spinal cord. This can have a devastating effect on the ability to balance. Because of this, the ability to track balance at various time points could serve as a valuable indicator of sensorimotor status. Purpose: The purpose of this case study was to test the feasibility of using the Wii Balance Board as a low-cost device that can track balance ability in an individual with MS. Methods: A 28 year old participant with relapsing-remitting MS was recruited from the SDSU Fitness Clinic for Individuals with Disabilities. A six-week balance-training program was implemented consisting of 3 training sessions a week for 20-30 minutes per session. Each session consisted of practicing games on the Wii Fit system by Nintendo. At the beginning of each week the subject’s balance ability was tested through 30-second trials looking at center of pressure using customized software integrated with the Wii Balance Board. Results: During the first few weeks, balance ability showed improvement in accordance with game performance and weekly center of pressure testing. However, at the beginning of week 5 the participant experienced a clinically relevant exacerbation. Importantly, there was evidence of when the exacerbation began prior to it being diagnosed with respect to our balance performance measures. Conclusions: These results demonstrate that monitoring balance with an affordable Wii Balance Board system can illustrate balance improvement, as well as potentially provide an early indicator of MS exacerbations. The earlier an exacerbation is recognized the better chance someone has of making a faster recovery, and also increases the chances of a full recovery.

Dome Window and Mount Design for a Large Scale Solar Receiver
E-Fann Saung, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

Windows are being evaluated for use in high temperature solar receivers to reduce radiative and convective losses. The design process of a 1.7 meter diameter quartz dome window is evaluated for its ability to maintain acceptable stresses when exposed to pressure differentials and large heat loads. The dome must be able to withstand the operational pressures of 0.5 MPa where the efficiency of the solar receiver is maximized, and temperatures upwards to 800°C may be observed. Brittle materials like glass need the tensile stresses to be reduced to maximize the reliability of the dome window. However, glass does not possess a characteristic strength and it is dependent on the flaw size. Careful attention to the dome mount must be taken to minimize tensile bending stresses that can cause a catastrophic or rapid failure while maintaining an environmental seal.

A method to characterize the strength of the quartz dome is discussed and aides in determining the maximum design stresses allowable during operation of the solar receiver. To determine an accurate model of the dome stress an FEA analysis of the dome will be discussed, a design trade study of the dome window geometry (ranging from a shallow angle to a full hemisphere) and its mount will be evaluated, and a statistical sensitivity analysis based on strength data will be carried out using the Weibull failure probability method. The combination of these perspectives will give insight on the process to design a glass dome window and to predict the reliability of strength.

Building Information Modeling and Field Operations: An Exploratory Study
Britani Harris, Construction Engineering (M)
Thais Alves, Civil, Construction, and Environmental Engineering

Over the past decade, the value generating aspects of BIM technology on the virtual design and coordination sectors of construction have been well documented. However, a more thorough understanding of BIM’s ability to assist in the sequencing and implementation of field operations is required in order to fully comprehend BIM’s effect on overall project productivity. For this paper, a case study of a 500,000 ft² OSHPD
hospital project in Southern California was performed in order to observe, identify, and analyze both the field operational activities which could potentially benefit from 4D BIM integration and the factors that could aid and/or deter successful 4D application in the field. Project data was aggregated over a six month period using a combination of observational studies and open ended interview questions. In order to analyze the data for interactions between field operational activities and 4D BIM applications, a relationship matrix was created. This matrix cross referenced Ballard and Howell's five criteria for quality assignments (definition, soundness, sequence, size, and learning) against documented uses for BIM and compared the positive interactions with observed field conditions to determine potential parallels. Once the applicable field activities were determined, collected data regarding these activities were scrubbed for factors which could aid/deter 4D BIM implementation. The resulting analysis confirmed that by adding transparency to production sequencing, visualizing trade and equipment movement, and understanding constraints in terms of the site and schedule, the use of 4D BIM can provide increased value in field operational activities.

163 Poster #23 9:00-10:45 am

An Analysis of High Reliability Foremen in Heavy-Civil Construction

Alejandro Mendoza, Civil, Construction, and Environmental Engineering (M)
Panagiotis Mitropoulos, Civil, Construction, and Environmental Engineering

A “High Reliability” foreman is defined as a foreman who performs high-risk work with consistently exceptional productivity and safety. This study investigates the work practices of High Reliability foremen on heavy-civil construction projects.

The focus is on high-risk trades that experience high rates of serious injuries and fatalities. The objective is to understand the work practices that reduce the likelihood of accidents while increasing productivity in heavy-civil construction operations.

High Reliability foremen are identified with the participation of local construction companies. This study uses a case study methodology in order to loosely observe and analyze the individual foreman’s practices. Data is collected using direct observation, multiple interviews with foremen and surveys of the foreman’s crew. Interviews with the foremen focus on the design of the work, such as work organization, resource planning, crew levels, safety considerations, production pressures, and task sequencing. The crew member surveys focus on how the crew member perceives the work in terms of mental demands, physical demands, temporal demands, performance, task effort, frustrations, surprises, engagement, and trade offs.

This study will describe how the foreman organizes the work is related to productivity and safety, measured by errors and exposure to hazards. The findings will provide other foreman with an opportunity to learn from the work practices of the high-reliability foreman and design their production system for reliability and safety.

164 Poster #24 9:00-10:45 am

Non Linear Aeroelastic Analysis of Joined Wing Configurations

Rauno Cavallaro, Aerospace Engineering (D)
Luciano Demasi, Aerospace Engineering & Engineering Mechanics

The main objective of this research is the study of the aeroelastic behavior of unconventional configurations, with a major focus on joined-wing vehicles.

Civil transport aircraft of the future are requested to improve their performances and to achieve a significant reduction of Direct Operating Costs, noxious emissions and noise. The problem of reducing Direct Operative Costs will not be solved without a significant improvement of aircraft efficiency, which can be hardly obtained by an optimization of conventional aircraft. Hence, new non-conventional aircraft layouts configurations provide an attractive alternative.

As pointed out by different leading aeronautical industries (such as Boeing, Lockheed Martin, Airbus, etc), one of these configurations is the joined wing. The main potential benefits range from a reduced induced drag to a more efficient structural design. Other interesting advantages are expected for the flight mechanics/dynamics behavior and capabilities, for engine integration possibilities, and for the operational impact.

One of the most advanced and relatively unexplored fields is the aeroelasticity of joined wings airplanes. Nowadays, the aeroelastic response has not yet been well understood and, therefore, represents an interesting phenomenon to be further explored. The particular wing layout of joined wings is responsible for strong structural geometric non linearities, which are relevant even for small angles of attack and attached flows.

More in detail, this research aims to analyze the static (divergence) and dynamic (flutter) aeroelastic instabilities and investigate the post-critical behavior with particular emphasis on the so called limit cycle oscillation (post-flutter analysis).

The analysis will be conducted for realistic wing box configurations, represented with high fidelity structural models. Aeroelastic tailoring by means of composite materials will be also investigated.
**Poster #25 9:00-10:45 am**

**Seismic Performance of Steel Anchor Bolts for Nonstructural Components**

Timothy Johnson, Structural Engineering (D)
Robert Dowell, Civil, Construction and Environmental Engineering

During seismic events, ground excitations generate relative displacement and force demands in structures. The nature of these responses is dependent on structural geometry, material, and mass distribution, but inertial lag causes demands at each floor to vary from those at ground level. For attachments with significant mass these can be extremely high, requiring the engineer to perform seismic design on both the attachment and the connection itself.

With this in mind, particular attention has been paid in the last two decades to seismic anchorage into concrete. However, a significant portion of ongoing research has focused heavily on the capacity side of anchors, leaving demands relatively unexplored. To compensate for this, the most recent revisions of ACI 318 Appendix D, the governing code for anchorage into concrete, has implemented a demand-side penalty onto steel anchors based upon their ductility. Outside a desire to be conservative and enforce desirable modes of failure, minimal background for this penalty exists warranting further investigation.

Research is currently being performed at SDSU investigating this value with the intent to refine its content and provide a theoretical basis for its use. This is being done on the structural engineering laboratory’s shake table using a steel frame called the WALLE. This frame has variable mass intended to simulate a variety of components, and several different types of anchorage are being investigated including brittle steel, ductile steel, elastic anchors, and mechanical anchors. Each possess unique behavior under dynamic loading and have different requirements in code.

Upon completion of testing, recommendations will be provided to current anchorage code committees. Further analysis using different types of systems will be conducted in future years, providing for a comprehensive look at anchorage for a variety of nonstructural systems.

**Session A-16**

**Poster: Cardiac Biology I**

Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

**Poster #26 9:00-10:45 am**

**Fluctuations of Calcium Signaling and the effects in Neonatal Cardiocytes**

Jterrell Moore, Engineering (U)
Paul Paolini, Biology

The real time contractile behavior of isolated mammalian cardiac cells is commonly recorded as a shortening of the cell during electrical pacing. Neonatal cardiac cells are preferred for study because they survive longer than adult cardiocytes. However, neonatal cells do not exhibit obvious shortening because their contractile machinery is not completely assembled. Therefore, an independent measure of the contractile potential of both adult and neonatal cells is the calcium (Ca\(^{2+}\)) transient. Transients reveal the magnitude of Ca\(^{2+}\) release from the Sarcoplasmic Reticulum (SR) through ryanodine channels (RyR), the subsequent reuptake of cytosolic Ca\(^{2+}\) by the SERCA pump, and Ca\(^{2+}\) exchange via the sarcolemmal Na\(^+\)-Ca\(^{2+}\) exchanger (NCX).

We suspect local fine structure is a contributing factor to variations in Ca\(^{2+}\) fluxes. Therefore, we target outside of the nucleus where there is an abundance of SR, and quantify the reuptake of Ca\(^{2+}\) within local fine structure of interest during contractility. We also take Ca\(^{2+}\) measurements in the periphery of the cell to establish that transients vary in different regions of the cell. The goal is to create a correspondence between functional data of contractility and gene expression for clinical applications. We addressed three questions: How variable are calcium transients within a single neonatal cell when recorded in comparable fine structure regions? How variable are transients from cell to cell within the same cytosolic region and do they provide statistically valid contractile measurement? How well does this measurement of contractility agree with our new computational assay of contractility?

Signals were averaged to improve S:N ratios. Parameters measured include the baseline (normalized to 0), amplitude (normalized to 1), intensity (signal integral), rapid (SERCA) and slow (NCX) resequestration rates, Ca\(^{2+}\) release rate (Ryr), peak time, onset time, and decay time. Expressed in terms of normalized transient records, the SERCA resequestration rate was 2.37 ± 0.30 %/sec, while the NCX cytosolic Ca\(^{2+}\) decrease rate was 0.154 ± 0.063 %/sec. The rate of calcium release was estimated to be 73 mM/sec, fast resequestration 42 mM/sec and slow recovery 0.52 mM/sec. By comparison, contractile records exhibited 4% error, while the Ca\(^{2+}\) transient showed 6.9% error.
ABSTRACTS

167 Poster #27 9:00-10:45 am
Unpaced Neonatal Cardiocyte Dynamics in Culture
Jeremy Mitchell, Physics (U)
Paul Paolini, Biology
Contractile protein expression in mammalian ventricular cardiomyocytes has been studied in abundance in its developmental phases, from embryonic to neonatal to adult. However, due to their unique morphology, contractility measurements have been difficult to obtain. Cardiocytes are routinely paced in culture prior to experimental observation to simulate the development of the excitation in the maturing heart. We wondered how a lack of pacing in culture affects cell kinetics (e.g. shortening and relaxation velocities).

We hypothesized dedifferentiation would occur in cells rather than maturation and expression of adult protein isoforms in the absence of electrical stimulation.

Cells were harvested from 35 day old Sprague Dawley rats and cultured for 3, 5, 7, and 9 days without electrical stimulation. Digital video recordings were obtained using an inverted phase microscope with an attached digital camera.

We extracted a contraction signal using a measurement tool developed in our lab specifically designed to measure the contraction kinetics in neonatal cardiomyocytes.

The videos were analyzed using digital image processing techniques to obtain a contraction signal. We employed a neonatal cardiomyocyte contractility measurement protocol based on computational methods using the digital video recordings and shape representation of the cell by Fourier descriptors.

Measurements were taken of the functional responses of unpaced neonatal ventricular cardiocytes sampled on days 3 through 9. Calcium transients as well as contraction and relaxation rates slowed until day 7 and then increased at day 9. Cells which have not been paced fail to show adult characteristics (e.g. increased velocities) typical in cells which have been continuously paced. Furthermore, cells in culture for 7 to 9 days begin to express quickened contraction rates despite the absence of pacing.

168 Poster #28 9:00-10:45 am
Sorcin modulates mitochondrial calcium handling by increasing the mitochondrial calcium uniporter (MCU) in cardiomyocytes
Angelica Suarez-Ramirez, Biology (U)
Wolfgang Dillmann, UCSD
Sorcin localizes in cellular membranes and has been demonstrated to modulate cytosolic calcium handling in cardiac myocytes. Sorcin also localizes in mitochondria; however, the effect of sorcin on mitochondrial calcium handling is unknown. Using mitochondrial pericam, we measured mitochondrial calcium concentration and fluxes in intact neonatal cardiac myocytes over-expressing sorcin. Our results showed that sorcin increases both basal and caffeine-stimulated mitochondrial calcium concentration. This effect was associated with a faster calcium uptake and release. The effect of sorcin was specific for the mitochondria since similar results were obtained with digitonin-permeabilized cells where cytosolic Ca^{2+} flux was disrupted. Furthermore, mitochondria of cardiomyocytes in which sorcin was over-expressed were more Ca^{2+} tolerant. Sorcin increases mitochondrial Ca^{2+} concentration by increasing the expression of the mitochondrial calcium uniporter (MCU). Experiments analyzing apoptotic signaling demonstrated that sorcin prevented cytochrome c release induced by 2-deoxyglucose. Furthermore, sorcin prevented hyperglycemia-induced cytochrome c release and caspase activation. In contrast, antisense sorcin induced caspase 3 activation. Thus, sorcin-antiapoptotic properties may be due to modulation of mitochondrial calcium handling in cardiac myocytes.

169 Poster #29 9:00-10:45 am
Trapping and characterizing DNA repair intermediates in vivo
Nishtha Agrawal, Biology (M)
Anca Segall, Biology
During bacterial cell division, chromosomal DNA must be precisely replicated and then correctly segregated. During replication, DNA may suffer damage by various exogenous (e.g., ROS) or endogenous (e.g., irradiation) agents. The damage leads to formation of single strand gaps and double strand breaks, which may collapse the replication fork. To re-initiate replication, the collapsed replication forks must be rescued by one of several recombination-dependent pathways. The Recombination Dependent Repair (RDR) of replication forks frequently leads to the formation of chromosome dimers, which need to be resolved by XerCD recombination into monomers for efficient segregation. In order to ensure correct replication and to coordinate chromosome segregation with cell division, bacteria employ various nucleoid associated proteins, like MukBEF, SeqA, and MatP. SeqA prevents the over-initiation of replication at OriC by sequestration and may also inhibit early chromosome segregation so that both daughter cells have equal DNA content at the time of cell division. The recently discovered protein MatP binds specifically to matS sites in the terminus region and is thought to ensure timely segregation.

Our lab has previously characterized a peptide “wrwyrc” that binds Holliday Junctions and prevents their resolution. We have used this peptide as a tool to study homologous recombination in vivo in Salmonella by following the trapped Holliday Junctions in response to excess DNA damages created by AZT (DNA damaging agent). Apart from undergoing DNA repair by RDR and completing replication, DNA should also undergo efficient segregation for proper cell division. Our hypothesis is that in response to the AZT...
Autophagy in the Aging Heart

Michael Gurney, CMB (D)
Roberta Gottlieb, BioScience Center

Autophagy maintains cellular homeostasis by lysosomal degradation and recycling of damaged/dysfunctional organelles, removal of aggregated proteins, and the provision of energy to cells in times of stress. Recently, autophagy has been shown to decline with age in the liver and thymus, prompting us to ask if there was a corresponding age-related decrease in autophagy in the heart. The comparison of membrane-associated LC3-II to cytosolic LC3-I is indicative of autophagic formation, and is one of several parameters used to assess autophagic activity. Basal autophagy in C57BL/6 mice across five age groups from 2.5 to 24 months, assessed by Western Blot, demonstrated little variance in LC3-I but a significant decrease in LC3-II (ANOVA; n=3/age group; p>0.05 and p<0.0002, respectively). Also, a Triton-X insoluble fraction containing p62/SQSTM-1 and ubiquitinated proteins were shown to correlate with changes in aggrephagy. We found a significant increase in p62 and ubiquitinated proteins with increasing age (p<0.01). Both findings suggest a decline in basal autophagy with age. When subjected to an acute stress, such as fasting, the levels of LC3-II but not LC3-I increased in young and old mice (n=4/age group; p<0.05 and p>0.05, respectively). To determine if flux was impaired in the aged, we treated fasted mice with chloroquine, which prevents autophagosome/lysosome fusion resulting in LC3-II accumulation. We found LC3-II accumulated only in the young (n=4; p<0.01). Thus, the aged can mount an acute response but flux declines. Moreover, RT-qPCR analysis of cardiac tissue showed a significant decrease in atg5 and atg7 and a significant increase in atg8A, atg8B, lamp2A, atg4A, and atg4B expression with advancing age (> 2.5 fold change). The dysregulated mRNA levels are suggestive of overcompensation of clearance, and the data support an overall decline in function with age. Although not manifest in the same manner, autophagy dysregulation also occurs with age in BALB/c mice, a shorter-lived strain. Our findings may be relevant to cardiac injury, such as in ischemia/reperfusion, given the emerging importance of autophagy in cardioprotection.

Surface Any Genes Associated with DNA Repair in the Presence of a Holliday Junction- Stabilizing Peptide

Robert Gottlieb, BioScience Center

The Holliday Junctions at the termini of chromosomes must be resolved to prevent formation of chromosome dimers, which may compete with 4 chromatid sister centromeres to prevent the XerCD system from forming chromosome dimers. We are investigating if, in the absence of SeqA, chromosomes undergo more HR around the chromosome and thus must perform higher recombination at dif to resolve a greater number of chromosomal dimers. In contrast, MatP may compete with dif recombination. We are using our Holliday junction-stabilizing peptide to detect dif recombination by trapping the Holliday Junctions at the dif site.

Size Does Matter: The Smallest GaSe Nanocrystals

John-David Lyons, Biology (U)
Gregory Kalyuzhny, Chemistry

Gallium Selenide (GaSe) is a semiconductor that has potential applications in light-emitting diodes and solar cells. The known methods of synthesis of GaSe nanocrystals (NCs) involve reaction of highly toxic trimethylgallium with triethylphosphine selenide (TOPSe) in the presence of triethylphosphine oxide at a temperature above 250°C and produces NCs as small as 4 nm. We have developed a new method of synthesis of GaSe nanomaterials using the less toxic and non-volatile gallium acetylacetonate, TOP, TOPSe, toluene and octadecene at −150°C. Based on optical spectra, the synthesized nanostructures have the lowest reported size for GaSe. We have also established a purification process for GaSe NCs using the difference in solubility of the products and reagents and characterized the NCs by X-ray diffraction and transmission electron microscopy.

Solving Mystery of CdSe magic-sized nano-crystals with centrifugation

Anthony Rosado, Chemistry (U)
Gregory Kalyuzhny, Chemistry

Magic-size nanocrystals (MSNCs) are ultrasmall nanocrystals with defined molecular structures in the size range between 1 and 2 nm. Absorbance spectra of CdSe MSNCs, synthesized from cadmium nonanoate and trioctylphosphine selenide (TOPSe) in the presence of trioctylphosphine oxide at a temperature above 250°C and produces NCs as small as 4 nm. We have developed a new method of synthesis of GaSe nanomaterials using the less toxic and non-volatile gallium acetylacetonate, TOP, TOPSe, toluene and octadecene at −150°C. Based on optical spectra, the synthesized nanostructures have the lowest reported size for GaSe. We have also established a purification process for GaSe NCs using the difference in solubility of the products and reagents and characterized the NCs by X-ray diffraction and transmission electron microscopy.

Poster 
Nanoparticle Toxicity, Formation, and Properties
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

Session A-17
Poster:
Nanoparticle Toxicity, Formation, and Properties
Friday, March 8, 2013, 9:00 am – 10:45 am
Location: Library Dome

170 Poster #30 9:00-10:45 am

171 Poster #31 9:00-10:45 am

172 Poster #32 9:00-10:45 am
Exposed Nitrifying Bacteria

Investigating the Toxicity of Silver Ions to Chronically Exposed Nitrifying Bacteria

Issa El Haddad, Civil Engineering (U)
Tyler Radniecki, Civil, Construction, and Environmental Engineering

Due to a significant increase in the use of silver (Ag) as an antibacterial component in consumer-based products (in the form of silver nanoparticles), the effects of Ag on wastewater biota need to be studied. The central hypothesis of this study is that in a sequencing batch reactor (SBR) in which the hydraulic retention time is lower than the cell retention time (e.g. wastewater treatment plants), sub-inhibitory concentrations of silver ions (Ag+) will become lethal to wastewater ammonia oxidizing bacteria (AOB) chronically exposed to these low concentrations, due to an accumulation of Ag+ onto the cells. The SBR is a bioreactor where fresh growth media is continuously added to the reactor while the old media is continuously removed, to keep the total volume constant. *Nitrosomonas europaea* (the model AOB) was cultured in SBRs which had a hydraulic retention time of one day and a cell retention time of twenty-one days. UV-vis spectrophotometry and inductively coupled plasma mass spectrometry (ICP-MS) was used to measure the cell activity (via colorimetric nitrite measurements) and Ag+ concentrations. Previous 3-h batch assays indicated that 0.2 ppm Ag+ completely inhibited *N. europaea* cells. Thus, it was expected that *N. europaea* would start dying off at Ag+ concentrations as low as 0.1 ppm. However, preliminary experimental results showed only a slight decrease in cell activity at concentrations as high as 1 ppm. The *N. europaea* cells indicate behavior that renders them resistant to Ag+, which will be subject to further study to figure out the reasons why. The ICP-MS protocol has several issues achieving a complete Ag+ mass balance as indicated by the discrepancy between the Ag+ presence in the cell pellets and the supernatant. This is most likely due to Ag+ sticking to the glass vials, but this problem will be further analyzed in the future.

Silver Ion Affinity Studies

Anna Uribe, Environmental Engineering (U)
Tyler Radniecki, Civil, Construction, and Environmental Engineering

In order to understand the binding affinity that silver ions (Ag+) have with many of the biological macromolecules which exist in natural waters and wastewater, a series of Ag+ adsorption experiments were conducted. The goal of this work is to understand if there is a ratio or pattern that can be found to facilitate predictions of adsorption between Ag+ ions and various biological macromolecules and thus provide some insight on the ultimate fate and transport of Ag+ ions in the environment. The biological macromolecules used for these experiments were cells (*Nitrosomonas europaea* specifically), bovine serum albumin (BSA-model protein), Suwanee River humic acid (SRHA-the model humic acid), and alginate (the model polysaccharide).

The adsorption experiments were conducted in small flasks containing 10 ppm concentrate of Ag+. The flasks were well mixed and an Ag+-elective probe was used to continuously monitor the Ag+ concentration. A concentrated mass of the desired macromolecule was added to the flask and allowed to equilibrate with the Ag+ (about 5 minutes). The new Ag+ concentration was recorded and a new concentration mass of the biological macromolecule was added. The process continued until Ag+ concentration dropped below 1 ppm.

Each biological macromolecule showed a different Ag+ adsorption rate. *N. europaea* cells had the highest affinity for Ag+ followed by BSA, SRHA, and alginate. The affinity for Ag+ was directly correlated to the number Ag+ ligands and its affinity for Ag+ fell between that of cells/BSA and alginate. The results from this work will help provide the data needed to model the fate and transportation of Ag+ in both engineered and natural system.
Increased use of nanomaterials, including nickel oxide (NiO) and chromium (III) oxide (Cr$_2$O$_3$) in consumer products and industry has led to a need for a better understanding of both the fate and transport and the toxicity of nanoparticles (NP’s) after they have been released into the environment. Aggregation and sedimentation are limiting factors in the transport of NP’s in the environment. Therefore, sedimentation rates and zeta potentials (a measure of surface charge and predictor of aggregation) of the NiO and Cr$_2$O$_3$ NP’s was characterized in various aqueous medias (including in the presence and absence of natural organic matter) utilizing UV-vis spectroscopy and dynamic light scattering. Ion dissolution is a key mechanism of NP toxicity. Thus, the rate of ion dissolution from the two NP’s was monitored via inductively coupled plasma atomic emission spectroscopy. Finally the effects of the NP’s on population growth rate and photosynthetic yield for two species of phytoplankton, Isochrysis galbana and Dunaliella tertiolecta, was characterized by monitoring cell densities with a fluorometer and measuring photosynthetic yield with a pam controller equipped with a water – ED Emitter – Detector – Cuvette Unit.

Both Cr$_2$O$_3$ and NiO NP’s showed stable properties through sedimentation and zeta potential tests. NiO NP’s had decreased sedimentation rates in seawater and freshwater environments when introduced to humic acids while Cr$_2$O$_3$ NP’s had slow sedimentation rates that varied a small amount between samples. Both NiO and Cr$_2$O$_3$ NP’s maintained their negative charge (~-20 mV) in most conditions tested and significant aggregation was not observed. However, in seawater, both NP’s had a decreased surface charge (~-5 mV) which resulted in aggregation of the NP’s. Cr$_2$O$_3$ NP’s showed very little dissolution of [Cr$^{3+}$] over the 28 days. NiO, however, did show slight dissolution of [Ni$^{2+}$] in both seawater and freshwater but not in phytoplankton growth media. Cr$_2$O$_3$ NP’s did not reduce the growth rates or photosynthetic yields of the phytoplankton. NiO NP’s also showed insignificant results on growth rates. However, NiO NP’s did display toxic effects on the photosynthetic properties of the phytoplankton, especially at high concentrations, suggesting that growth rate alone may not accurately indicate the NP toxicity.

Spherical AgNPs were synthesized through the reduction of silver nitrate with sodium borohydride in the presence of a capping agent. To create triangular shaped AgNPs, citrate-capped AgNPs were exposed to either a blue light (420 nm), green light (522 nm), or red light (690 nm) for a period of two weeks with daily addition of additional citrate. The size and shape of AgNPs were confirmed with transmission electron microscopy (TEM). The influence of AgNP capping agents (e.g. citrate, PVP, and tannic acid), and shape (e.g. spherical vs. triangular) on the toxicity to N. europaea was determined by monitoring their nitrification activity during 3-hour batch bioreactor experiments. During these experiments, N. europaea was exposed to the various AgNPs and the NO$_2^-$ production was measured colorimetrically every 45 minutes over the course of 3-hours.

Synthesis of triangular silver platelets ranging from 50-300 nm and pentagonal AgNPs ranging from 40-60nm were confirmed by TEM imaging after two weeks of exposure to red light (690 nm) and blue light (420 nm), respectively. Green light (522 nm) did not elicit noticeable changes in shape when compared to spherical AgNPs not exposed to light. The results from the toxicity experiments suggest that the capping agents (i.e. citrate, PVP and tannic acid) did not influence the toxicity of the AgNPs towards N. europaea. Further work is needed to size fractionate and purify the triangular AgNPs for future toxicity studies.
Session A-18

**Poster: Astronomy and Mathematics**

**Friday, March 8, 2013, 9:00 am – 10:45 am**

**Location: Library Dome**

**178** Poster #38 9:00-10:45 am

*Reduction of Order for Higher Order Linear Ordinary Differential Equations*

Nadia Ott, Mathematics (U)
Mark Dunster, Mathematics and Statistics

Reduction of order is a technique in mathematics used to solve ordinary differential equations. While its usefulness to higher order equations is often disregarded it is, in theory, applicable to \(n\)-th order equations. In practice, reduction of order is rarely constructive for equations of higher than second order due to severe practical difficulties. However, the powerful method of variation of parameters is primarily a clever modification of reduction of order. Recognizing this important relationship provides incentive to further explore the applicability of reduction of order to higher order ordinary differential equation. An innovative approach using reduction of order to solve higher order differential equations using Abel’s differential equation identity and the definition of the Wronskian is demonstrated by this research.

Exploring the applicability of the method of reduction of order to higher order differential equations is an essential step in fully utilizing the method throughout the field of differential equations. Given the many applications of variation of parameters in the field of partial differential equations (e.g., as a method to solve the heat and wave equations) it follows that reduction of order could be useful in such a context. Further work will be carried out on possible implementations of reduction of order as well as look in to interesting properties of Abel’s theorem and the Wronskian and their relation to differential equations.

**179** Poster #39 9:00-10:45 am

*Visualizing the Kepler Project*

Grace Mervin, Astronomy (U)
Jerome Orosz, Astronomy

An information graphic designed to clearly explain what the Kepler Project is, how it works, and the importance of the data being collected. The purpose of this visualization is to present scientific information in a approachable, easy to understand, and visually interesting format.

**180** Poster #40 9:00-10:45 am

*The Effect of Gravitational Lensing on Dark Energy Measurements*

Carolina Galindo, Astronomy (U)
Kim Griest

Dark energy is an unknown substance that constitutes approximately three fourths of the energy density of the universe. The properties of dark energy can be measured using the brightness of Type Ia supernovae, which are “standard candles” (have a well known intrinsic luminosity). Measurements of the brightness of such exploding stars have enabled us to determine how far away they are located, and this has provided evidence indicating that the universe is expanding at an accelerated rate.

Gravitational lensing by intervening galaxies, however, can lead to inaccurate results by causing an object to appear brighter than it is, thus giving the erroneous impression that the object is closer than it actually is. In this project, the lensing equations are derived. We then incorporate Hubble Space Telescope data of SN 1997ff from Benitez et al. into the derived equations, which then allows us to correct the distance to this supernova. We study sources of error in making this distance correction including the model of the galaxies and measurement errors.

**181** Poster #41 9:00-10:45 am

*Relative Nova Rates in Three Virgo Elliptical Galaxies with Differing Globular Cluster Specific Frequencies*

Chris Curtin, Astronomy (M)
Allen Shafter, Astronomy

It has been proposed that a significant fraction of novae binaries in a galaxy might be spawned in the galaxy’s globular clusters, and therefore that a galaxy’s nova rate will be sensitive to its globular cluster specific frequency, \(S\). In order to test this hypothesis, we have undertaken a survey with the CFHT to measure and compare the nova rates in three Virgo elliptical galaxies having significantly different globular cluster specific frequencies: NGC 4486 (\(S = 14\)), NGC 4472 (\(S = 3.6\)), and NGC 4374 (\(S = 1.6\)). Since these galaxies are equidistant and have similar Hubble types, the raw observed number of novae can be compared directly to determine the ratio of specific nova rates. Observations were made over four epochs. Two epochs separated by ~50 days and two more epochs about a year later separated by ~30 days. Numerical experiments indicated that during our two years of observations we would expect to observe approximately 12, 12, and 7 novae per year in NGC 4486, NGC 4472, and NGC 4374, respectively, under the null hypothesis that the nova rates scaled directly with galaxy luminosity. On the other hand, in the extreme case that all nova binaries are formed in clusters, we would expect to observe approximately 50, 12 and 3 novae in the three galaxies, respectively. An analysis of all four epochs has yielded a total of 27 nova candidates: 26 in
NGC 4486, 29 in NGC 4472, and 21 in NGC 4374. These results are consistent with the null hypothesis that the nova rates simply scale with galaxy luminosity, and do not support the idea that a galaxy’s nova rate is significantly affected by its globular cluster specific frequency.

182 Poster #42 9:00-10:45 am
Full Elasticity in Local Singular Arithmetical Congruence Monoids
Cody Allen, Mathematics (M)
Vadim Ponomarenko, Mathematics and Statistics
This paper will examine Local Singular Arithmetical Congruence Monoids (ACM’s) and determine if they are fully elastic. First, we will restrict our view to a sub-monoid of the given ACM which is chosen so that only two prime numbers divide any element. This submonoid is carefully chosen so that it is fully elastic on an interval. The second step involves defining a transfer homomorphism between the submonoid and a subset of NxN.

183 Poster #43 9:00-10:45 am
Depression as a Mediator for the Relationship Between Child Abuse and Dating Violence
Olga Villanueva, Psychology (U)
Emilio Ulloa, Psychology
Dating violence (DV) is a prevalent phenomenon among adolescents that has gained attention among researchers in recent years due to the alarmingly high rates of abuse reported. More than 80% of the girls in their study reported having perpetrated or received psychological violence at some point in their dating relationships (Cyr, McDuff, & Wright, 2006). In addition to the high prevalence, there are serious consequences of DV that include increased risk for engaging in serious health concerns including substance abuse, unhealthy weight control, sexual risky behaviors, pregnancy, and suicide (Silverman, Raj, Mucci, & Hathaway, 2001). One prevalent risk factor for DV identified throughout the literature is child abuse (Filipas & Ullman, 2006). For example, in one study child sexual abuse (CSA) is associated with higher rates of physical victimization, and the use of violence during CSA is associated with perpetration of psychological abuse in dating relationships (Cyr et al., 2006). Moreover, child physical abuse and neglect are significant predictors of DV perpetration in females, while child neglect increases the risk for DV victimization in males (Fang and Corso, 2007).

One possible explanation for the association between child abuse and DV might be that those with early abuse experiences adopt behaviors or cognitive frames that put them at risk for future violence; the current study aims to better understand this relationship. Specifically, depression has been related to DV (Foshee, Benefield, Bauman, Ernnet, & Suchindran, 2004) and to child abuse (Fang & Corso, 2008). Furthermore, Wolfe, Wekerle, Scott, Straatman, and Grasley (2004) found evidence suggesting that trauma-related symptoms mediate the relationship between child abuse and dating violence perpetration, which may include depression (Sanders & Moore, 1999). Taken together, it is predicted that depression may act as a mediator for the relationship between child abuse and DV. Data from waves 2 and 3 from the National Longitudinal Study of Adolescent Health (Add Health) will be used for this analysis, focusing on emotional state, mistreatment in romantic relationships, and mistreatment by adults. The sample includes young adults, ages 13-28.

184 Poster #44 9:00-10:45 am
Post traumatic Growth In Relation to Interpersonal Violence: A Review
Monica Guzman, Psychology (M)
Emilio Ulloa, Psychology
Post-traumatic growth, or PTG, is the positive psychological growth that a person may experience after experiencing a traumatic event. PTG is an area of study researchers have currently been interested in because of the implications for positive outcomes (including personal growth) associated with trauma. Research has shown that PTG has been found as a result of different types of traumas, such as medical and single-event traumatic events. For example, eighty-three percent of breast cancer victims have been found to demonstrate at least one sign of positive growth after surviving treatment (Burke & Sabiston, 2012). Although PTG is well documented across different types of traumas, it is unclear how it relates to relationship abuse and assault. Studying PTG and how it relates to interpersonal violence can help find intervention efforts that may benefit trauma victims. The current study provides a review of the literature concerning PTG that is associated with intimate partner violence and sexual assault. The literature that was reviewed relied on articles that used the term PTG or the personal growth benefits that comes from trauma. We reviewed these articles and coded them for themes to draw relevant conclusions. Results indicate that IPV and assault are consistently associated with PTG. However, many researchers suggest that it may difficult to determine the exact nature of PTG given the time span between the traumatic event and the timing of questionnaires about PTG. Conclusions from the review, including findings regarding relevant predictors, context, and implications for treatment, intervention, and prevention efforts are summarized. The review discusses future research
avenues to identify better counseling techniques. It further renders a thorough empirical review of the relationship between PTG and psychological abuse, specifically interpersonal violence (IPV) to add a new perspective to trauma therapy.

185 Poster #45 9:00-10:45 am

**Child Abuse and Disordered Eating Behaviors: Does Dating Violence Moderate This Relationship?**

Marissa Salazar, Psychology (M)

Emilio Ulloa, Psychology

Experiencing victimization as a child, such as being a victim of child abuse, may contribute to disordered eating tendencies. Repeated victimization experienced in a violent dating relationship places females at higher risk for disordered eating compared to females who have not experienced dating violence (Silverman, Raj, Mucci, & Hathaway, 2004). Although dating violence has been studied in this domain, there has been little research examining the direct relationship between child abuse and disordered eating and the moderating role of dating violence.

The current study uses secondary data from the National Longitudinal Study of Adolescent Health (ADD Health) to determine if dating violence increases the likelihood of engaging in disordered eating behaviors among females who experienced child abuse. For the purposes of the current research, the data from 7,556 female adolescents completed Wave 2 and Wave 3 of the study. All self-report questionnaires were completed in the participants’ home and featured questions about disordered eating behaviors and retrospective reports of child abuse. Dating violence was measured by asking the respondent if any of their partner’s over the previous 18 months had been physically or verbally violent towards them.

An index of dating violence was created, wherein the amount of violence participants did or did not experience from three different partners was computed into one variable from the original twelve questions. Preliminary results reveal correlations between experiencing dating violence and disordered eating tendencies. A positive relationship exists between vomiting to lose weight and dating violence, such that females who suffered dating violence had higher levels of vomiting compared to females who were not in a violent dating relationship. Taking diet pills to lose weight and dating violence was also correlated, as well as using laxatives as a form of weight loss. There was also a correlation between experiencing child abuse and propensity to engage in disordered eating behaviors, as female victims of child abuse scored higher on measures of disordered eating compared to females who were not abused.

Future research should examine other factors that could buffer or strengthen this relationship, such as risky sexual behavior, psychopathology, and suicide ideation.

186 Poster #46 9:00-10:45 am

**Intimate Partner Violence**

Julia Jaroslawski, Nursing (U)

Janet Finkel, Nursing

“Over 3,000 domestic violence incidents are reported in San Diego's East County annually. Research shows that for every reported case there are two more that go unreported. “(Joel Anderson–supporter of efforts to assist victims of domestic violence) Risk for violence is related to rise in Intimate Partner Violence incidence in San Diego’s East Region as evidenced by 6,000 phone calls to Domestic Violence hotlines in 2011. Domestic Violence is the #1 cause of Emergency Room visits by women, and 40% of all ER visits are related to domestic violence. This is a preventable problem, and by using specific nursing protocol, we can help researchers measure risk and protective factors for victimization in a uniform manner which ultimately informs prevention and intervention efforts of domestic violence.

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Session B-1

**Oral Presentation:**

Research in Molecular Medicine

Friday, March 8, 2013, 11:00 am

Location: Love Library 2203

187 11:00 am

**Effect of Vitamin D Administration on Cerebellar Purkinje Cells Following Developmental Alcohol Exposure**

Philip Silva, Cell Biology (U)

Jennifer Thomas, Psychology

It is well known that prenatal alcohol exposure can have devastating effects on the developing fetus. Consequences of prenatal alcohol exposure include growth deficiencies, distinct physical features and behavioral deficits including motor impairments. These effects are collectively referred to as fetal alcohol spectrum disorders (FASD). Therapeutic interventions are needed to mitigate behavioral deficits seen in FASD. Vitamin D can have neuroprotective qualities and, in fact, vitamin D deficiency can be a consequence of chronic alcohol abuse. Using a rodent model, we have previously shown that vitamin D can attenuate motor coordination deficits associated with developmental alcohol exposure. The present study examined if vitamin D improves motor performance by protecting against cell death in the cerebellum, a brain area involved in motor function. Subjects were randomly assigned to one of six treatment groups: 4 alcohol-exposed (0, 5, 10, or 15 mg/kg vitamin D) and 2 sham controls (vehicle, 15 mg/kg vitamin D) groups. Alcohol (5.25 g/kg/day) was administered via intragastric intubation between...
postnatal days (PD) 4-9, a period of brain development equivalent to the 3rd trimester, and vitamin D was injected s.c. daily between PD 2-30 (before, during and after alcohol exposure). On PD 95, subjects were intracardially perfused and cerebella collected. Stereological analyses were used to estimate Purkinje cell number, Purkinje cell density, and cerebellar volume. Preliminary data indicate that vitamin D does not protect against alcohol-related deficits in motor performance by protecting against cerebellar cell death. Rather, vitamin D must improve motor performance either by altering function of existing cerebellar circuits or by affecting other motor areas.

Supported by the NIH/NIGMS 5T34GM008303-23 and ABMRF/ The Foundation for Alcohol Research.

188  11:15 am
Pancreatic Betal Cells: The interdependence of intracellular calcium and insulin release
Perla Vega, Mathematics (U)
Diana Verzi, Mathematics

Pancreatic beta cells are responsible for insulin secretion. If the right amount of insulin is secreted, glucose is used in our bodies effectively. Very high glucose in the body can cause it to malfunction, and diabetes can eventually take place. Diabetes has a very negative impact on the organism: It can cause to kidney failure, leg amputation, and death. This project models beta cell signaling and insulin release dynamics.

We have looked at calcium and voltage oscillations, using activity as a measure for insulin release. Calcium may play a significant role in beta cells dynamics. Fitzhugh-Nagumo kinetics were initially used to model the fast sub-system for membrane potential (V), switching to Morris-Lecar to include the interdependence of beta cell chemistry and blood insulin-glucose levels.

Results to-date qualitatively recover experimental results reported in the literature. We need to fit parameter values to data from the literature for healthy and diabetic subjects. We will then add calcium release from the endoplasmic reticulum, and the effects of acetylcholine and Ip3 receptors on membrane oscillations (V), and report results at the summer SIAM conference and in publication.

189  11:30 am
Using microfluidics chambers (Mother Machines) to observe individual cell physiology
DaKandryia Peters, Biology (U)
Anca Segall, Biology

The Mother Machine is a microfluidic device built for the observation of bacterial cell growth and responses to controlled conditions. The Mother Machine is made of polydimethylsiloxane, a silicon-based optically clear organic polymer, bonded to the thin glass bottom of a Willco dish, which makes it observable with an inverted epifluorescence microscope. The Willco dishes fit into a custom-built microscope stage that maintains constant temperature control. Features of the Mother Machine include a main channel through which media and cells can be pumped in and side channels in which cells can divide, allowing the observation and measurement of many single cells as opposed to losing track of a particular cell while it grows exponentially on a slide mounted agarose pad. The Mother Machine can be used to observe the physiological consequences that different antibiotics have on the cell. Norfloxacin and Novobiocin are known DNA Gyrase inhibitors, a type II topoisomerase which is an enzyme that cuts bacterial DNA to maintain proper DNA topology during both replication and transcription, preventing cell division. The Mother Machine allows the observation of the effects of these inhibitors such as slowed cell growth, cellular filamentation, and membrane damage using florescence microscopy. Other experiments testing the effects of prophage induction and DNA damage in E. coli and Salmonella are in progress as well. The Mother Machine’s ability to dynamically follow multiple cells over several generations at the single level make it a very useful device in studying cellular physiology.

This work was funded in part by grant NSF 0827278 for Interdisciplinary Training in Biology and Mathematics, awarded to A.S. and P.S., and a SDSU-UGP grant awarded to A.S.

190  11:45 am
Statins Promote Cardioprotection via Induction of Mitochondrial Autophagy
Genaro Hernandez, Biology (U)
Roberta Gottlieb, Biology

Statins are widely prescribed cholesterol lowering drugs that inhibit HMG-CoA reductase, the rate-limiting enzyme in cholesterol biosynthesis. Long-term clinical studies have demonstrated the cardioprotective potential of statins, independent of serum-cholesterol lowering. Autophagy is a cellular process that degrades damaged proteins and organelles to promote homeostasis. Autophagy is also required for cardioprotection. Moreover, we have shown that statins induce autophagy in the heart via the Akt/mTOR/ULK1 pathway and promote cardioprotection in mice. Interestingly, statins are unable to confer cardioprotection to mitochondrial autophagy (mitophagy) impaired Parkin-knockout mice (PKO). These preliminary results showed that mitophagy was essential for statin-induced cardioprotection. However, the mechanism by which statins induce mitophagy remains undiscovered. Besides blocking intracellular cholesterol production, statins also block production of coenzyme Q10 through inhibition of HMG-CoA reductase. Coenzyme Q10 is an isoprenoid important for mitochondrial function. Thus, we hypothesized that statins induce mitophagy and promote cardioprotection via depletion of coenzyme Q10.
To investigate this, we supplemented coenzyme Q10 to HL-1 cardiomyocytes treated with 1μM simvastatin or vehicle DMSO for 24 hours. We observed through fluorescence activated cell sorting (FACS), a loss of mitochondrial membrane potential upon statin treatment but a high potential was maintained when coenzyme Q10 was supplemented. Translocation of the mitophagic marker Parkin to the mitochondria was increased under statin treatment and prevented when coenzyme Q10 was supplemented as observed via microscopy. Mitochondria showed increased fission through microscopy upon statin treatment but remained elongated when coenzyme Q10 was supplemented. Mitochondrial loss was observed via microscopy with statin treatment but did not occur under coenzyme Q10 supplementation. To test that cardioprotection by statins is also dependent upon depletion of coenzyme Q10, wild-type mice were treated with 20 mg/kg simvastatin and supplemented with coenzyme Q10 for 4 hours before subjecting them to ischemia/reperfusion injury. The supplementation of coenzyme Q10 showed a decrease in the cardioprotection conferred by statins. Together, these results suggest that statins confer cardioprotection via the depletion of coenzyme Q10 which promotes mitochondrial autophagy. The outcomes of this study open the door to regulation of mitophagy and mitochondrial turnover as potential therapeutic targets in the treatment of heart failure.

191 12:00 pm
Using stable isotopes in a dietary study of rattlesnakes
Darren Fraser, Biology (U)
Rulon Clark, Biology

Feeding ecology in rattlesnakes has been studied extensively using field observations and examination of stomach contents in both live and dead snakes. However, it is difficult to examine the feeding ecology of individuals using these direct methods, because individual rattlesnakes are ambush foragers that feed infrequently. Thus, inferences made regarding feeding ecology at a population level can miss individual specialization in prey preference and potential ontogenetic shifts in diet. The increased use of stable isotope analysis in studies on dietary behavior and trophic level relationships represents a potentially useful new method for studying feeding habits in rattlesnakes at an individual level. Stable isotope signatures (the ratio of heavy to light isotopes) of an animal tissue can be directly related to the stable isotope signatures of the food they eat. By measuring isotopic signatures in tissues of both potential prey items and rattlesnakes, we may be able to infer dietary habits of both individuals and populations. The use of stable isotope analysis in dietary studies has been expanding, but it has been limited primarily to studies of mammals and birds. Very few reptiles and even fewer snakes have been examined isotopically. Here, we explore the use of stable isotope analysis of blood and rattle tissues as a method to track prey preference specialization and dietary shifts in rattlesnakes. We measured the relationship of isotope signature between rattlesnakes and their food by feeding 20 captive Timber rattlesnakes (Crotalus horridus) two isotopically distinct food sources. We expect the stable isotope signature of the snake tissues to reflect those of their food source and shift according to isotopic shifts in their diet. Preliminary data suggests that a shift in isotopic signatures is detectable in the blood samples collected from our captive snakes. However, individual variation in isotope signatures may make it difficult to identify diet using stable isotope analysis alone.

192 12:15 pm
Lower Cytotoxic Immune Responses Contribute to Racial Disparities in Colorectal Cancer
Jinel Shah, CMB (M)
Kathleen McGuire, Biology

Colorectal cancer (CRC) is the third leading cause of cancer associated deaths in developed countries. Chromosomal instability (CIN) accounts for 80–85% of sporadic cancers. African Americans (AA) have a higher rate of sporadic CRC as compared to Caucasian Americans (CA) in the United States. Several studies have shown that cytotoxic immune cells infiltrating in the tumor microenvironment play a pivotal role in protection against the tumor but the question remains whether they play any role in racial disparity. Previous studies in our lab included looking at the North Carolina Colon Cancer Study (NCCCS), a population-based cohort (45% AA and 55% CA), for one immune marker at a time to understand the role of that marker in the observed racial disparity between AA and CA. These studies analyzed CD8+ cell infiltration using immunohistochemistry in the NCCCS CIN tumor samples. The infiltration was statistically compared using a nonparametric Mann Whitney U test. CD8+ cells are associated with better prognosis of CRC; however, we did not see a significant difference in their infiltration in the tumor tissues of the two races (p=0.823). To determine the functionality of immune cells, we had previously looked at the cytotoxic cell marker Granzyme B (GzmB) and compared the infiltration of positive cells in the tumor tissues. We saw that GzmB+ cell infiltration was significantly different, suggesting that AA are less protected from CRC than CA (p=0.004). We next investigated the correlation of CD8+ and CD57+ cells with GzmB+ cell infiltration using the Spearman test. We saw that when the CD8 and CD57 markers were more positively correlated with GzmB in CA (r=0.7, 0.5 respectively) than AA (r=0.5, 0.3 respectively). The difference observed in correlation between CD8 and GzmB in the two races was significant (p=0.047).

Looking at these results, we wanted to check if the infiltration of GzmB+ cells depends on the infiltration of CD8+ and CD57+ cells in the tumor microenvironment. To approach this question,
we investigated the difference by race in the GzmB+ cell infiltration in samples with high CD8+ and CD57+ cell infiltration. We saw that infiltration of GzmB+ cells with high CD8+ and CD57+ cell infiltration was significantly greater in CA than AA (p = 0.013, 0.018, respectively). Overall, these results suggest that, even with equal presence of immune cells in the tumor microenvironment, AA have lower cytotoxic immune responses as compared to CA, making them more vulnerable to aggressive disease. Acknowledgements: This study was funded by the National Cancer Institute Comprehensive Partnerships to Reduce Cancer Health Disparities (CPRCHD) grants (U54CA132384 and U54CA132379) and 1U01CA162147 (to KLM and JMC).

193 12:30 pm
The interaction of bacteriophage with the human mucosal immune system
Natasha Talago, Microbiology (M)
Forest Rohwer, Biology

Mucosal epithelia form the frontline of defense at metabolically active sites throughout our body. These mucosal surfaces continuously secrete mucin molecules, which are large, negatively charged glycoproteins that form the gel-like secretions termed ‘mucus’. Mucus is constantly secreted and shed from epithelial surfaces thus protecting the underlying epithelia against infection. The outer mucus layer is known to contain both bacteria and bacteriophage (viruses that only infect bacteria). Recently, our lab proposed the Bacteriophage Adherence to Mucus (BAM) mathematical model, illustrating bacteriophage adherence to mucosal surfaces resulting in a dynamic, non-host derived, antimicrobial layer as a model of innate immunity.

In vitro studies demonstrate that phage adherence to the mucus of invertebrate and vertebrate metazoans is mediated by hypervariable immunoglobulin-like (Ig-like) domains. Phage adherence to mucosal surfaces resulted in decreased in microbial colonization of the mucus and protected the underlying host epithelium from cell death. Here, we used the Escherichia coli T4 coliphage, which displays three immunoglobulin-like (Ig-like) domains via the highly immunogenic outer capsid (hoc) protein, to investigate the response of the human mucosal immune system to phage addition.

Hoc+ and hoc− T4 phage were applied to confluent monolayers of mucus-producing A549 lung epithelial cells and incubated at 37°C at 5% CO2 for 30 min. and 16 hours. A549 cells, with and without phage addition, were scraped from tissue culture plates, cellular proteins extracted by Triton-X, followed by protein precipitation and purification. Cellular protein profiles were analyzed by two-dimensional gel electrophoresis (2DGE) and showed numerous phage-induced eukaryotic cellular protein responses.

Liquid-chromatography mass-spectrometry (LC-MS) analysis of differing 2DGE protein spots will be analyzed to determine phage-mediated eukaryotic immune responses. Further, transcriptomic studies will be conducted to determine which genes are being actively expressed 30 min. and 16 hours after phage adherence. This study looks to identify novel phage-mediated immune responses and may have significant application for future mucosal immunological studies. New approaches, such as understanding mechanisms of attachment and signaling pathways of eukaryotic cells, to prevent serious bacterial infections are still needed.

Session B-2
Oral Presentation: Identity and the Self
Friday, March 8, 2013, 11:00 am
Location: Love Library 430

194 11:00 am
Coming to Our Senses: The Dominant Eye, The Enslaved Ear, and the Struggle for Salvation
Anders Larsson, MALAS (M)
William Nericcio, MALAS

Modern civilization is understood and expressed through the visual world of the eye. This is the inescapable reality realized through our various forms of expression, including language, painting, architecture, film, and photography. Though we use smell, touch, taste, and hearing, it is the visual realm which dominates our metaphors, scientific pursuits, legal authority, and so on. Vision, the domain of the eye, is equated with reality in this life. The eye, however, and hearing are equated with that which humans sense but cannot prove. The domain of the ear is all that is spiritual and supernatural. Though humans align themselves with the eye in their everyday lives, they yearn to live in the realm of the ear. This desire is manifested especially in music, but it does not stop there. Through an interdisciplinary approach, it becomes apparent that much of what typically is regarded as the domain of the eye is in fact that of the ear. Since the move away from traditional oils, painting has steadily become more closely aligned with the ear that the eye. Photography also attempts to escape the shackles of vision. Music instruments, computer technology, and information are increasingly leaving the tactile and visual realm and ending up somewhere intangible and abstract. In art, fashion, sexuality, and music we increasingly find phenomena which make reference to nothing, an in fact are what have been dubbed “hyperreality”. This abstract world void of physical and visual references can only be understood by the ear. In today’s world it will become increasingly important to adapt this interdisciplinary approach of the ear in regards to diverse matters such as art, communication, and intellectual property.
People's language choices are used to associate or disassociate with different communities based on their position in society (Labov, 1990; Cameron, 1997; Eckert, 1996). Though these choices are often made based on social class, ethnicity or gender, the language behavior does not always match the socially imposed categories. Many people use language associated with African American English (AAE) to construct a specific identity via hip hop culture (Alim, 2004). The subject I am studying is a biracial physical therapist who reflects this phenomenon I call 'thug identity'. He grew up in an all white family who often indexed lower class identity specifically with the use of non-standard English. A first generation high school graduate, the subject went on to college and earned a doctorate in physical therapy. I am observing his language patterns in various social settings to see if there is any language change around his clinic vs. his family. This research exposes the role that non-standard varieties of English play in the construction of identity characterized by their involvement with hip hop communities and not by their socially imposed categories.

Session B-3

**Oral Presentation:**

**Latin American History and Anthropology**

Friday, March 8, 2013, 11:00 am

Location: Love Library 431

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196 11:30 am

**Linguistic variation to index one’s identity**

Nicole Siminski, Applied Linguistics (M)  
Doug Bigham, Linguistics

This research project observes the construction of an identity in various social situations through the utilization of available tools such as music, attire and, specifically, linguistic resources. Identity can be constructed linguistically using phonological features, specific word choices and discourse patterns. The subject involved is a 33 year old male physical therapist. This research project observes the way the subject speaks in different social situations. Data is collected from the subject as he interacts with different participants from various social groups and indexes varying degrees of his identity using language associated with hip hop culture and analyzed for linguistic variation.
demonstrate my years of independent research and personal endeavor into the Macehuallahatliolli (Indigenous Languages) and the Macehuallahucuililli (Indigenous Writing Systems) of Anahuac (Mesoamerica). We will discuss the problematic (mis)understandings and (mis)classifications of the Mexihcatlahcuililli (Mexican/Nahuatl Scripture) when discussed from a ‘modern’ or ‘western’ perspective that manipulates the debate and discussion on the topic of writing systems and what defines ‘writing’.

During the exploration and explanation of the Mexihcatlahcuililli we will discuss the main functions and uses of the writing system; however, we will also offer a more balanced approach through assuming a more active role in the research topic by seeking to understand the Mexihcatlahcuililli from within, from inside out, to be contrasted by the ‘objectified’, ‘scientific’ and outsider’s observations of the writing system. We seek to present a well-balanced, but simplified (though not unimportant or inaccurate) approach to the Mexihcatlahcuililli. Important figures in the research of Anahuatatlahcuililli (Mesoamerican Writing Systems) such as Alfonso Lacadena, a Maya epigrapher, and Hanns Prem, a Nahuatl scholar, will be part of the pivotal research I will present in PowerPoint fashion.

199  11:30 am

Racial Ambivalence Toward Mulattoes in Positivist Honduras, 1860–1887
Shayla Jacobs, LAS (M)
Paula De Vos, History

The mulatto was a slave-descended person of mixed-race who was present in Honduras (and Latin America) since the colonial period. During this time, the mulatto was also identified as a ladino, a person of mixed-race who was not indigenous. Another group, the Garifuna, also solidified the identification of the mulatto as “ladino”, as prominent mulattos began to define the Garifuna as “true blacks”. During the construction of the nation after independence in 1824, many mulatto-ladinos were involved in leadership and assumed roles that whites or mestizos did in other parts of the region, under the banner of regional liberalism. While liberalism championed the freedom of “all men” and Honduran mulattos could enjoy “freedom”, positivism and scientific race theory began to circulate, denigrating slave-descendants to a place of inferiority. The place of the mulatto thus remained somewhat precarious, though many Honduran mulattos made strides in social standing. Positivism, under the theme of “order and progress”, sought to improve and modernize society by “whitening” the mixed-race masses through European immigration. When “whitening” was unsuccessful, Latin American elites and intellectuals sought to modernize society through educational reform. Two Honduran intellectuals, Ramon Rosa and Dr. Antonio Vallejo, were responsible for implementing educational reform in the early 1880s, which included the rewriting of

Honduran history. The appearance of the mulatto in the record demonstrates that these intellectuals did not necessarily seek to erase slave-descended Hondurans from history. Instead, these intellectuals included mulattos in national history as racially-mixed contributors in the population. However, by the census of 1887, mulattos were collapsed into a “ladino” group, indicating ambivalence about the physical presence of mulattos. This decision was likely influenced by positivist scientific race theory, though Honduras was more racially liberal. The inclusion of mulatto history itself, but the omission of the racial category of mulattos in the 1887 census exhibits that mulattos were worthy of recognition in the national Honduran memory, but not of racial recognition in late nineteenth century Honduran society. In the case of Honduras, there was ambivalence toward the slave-descended mulatto instead of blatant racism, revealing the complexity of race in positivist Latin America.

200  11:45 am

Power Dynamics along Borders: U.S. Media Depictions of Women Maquiladora Workers and Mexico
Rhianna Maras, Women Studies (M)
Sara Giordano, Women’s Studies

The relationship between the United States and Mexico continues to be a source of tension as a result of their economic and geographic interdependency. Using articles from the L.A. Times, this research examines how the U.S. media portrays female factory workers in Mexico, and how this is connected to the positions of both the U.S. and Mexico within the global economy. To assess the U.S. depictions of female maquiladora workers in Mexico, I utilized 12 newspaper articles from the L.A. Times between 1986 and 1999 found through the SDSU Database, ProQuest Newsstand. The depictions of the female character were measured using seven categories; physical appearance, emotional response, empowerment, motherhood/marital status, exploited/vulnerable, victimized, and entrepreneurs. The results indicated that the U.S. media most commonly presents female maquiladora workers in connection with motherhood/marital status (100 percent), physical appearance (58.3 percent), and lastly as entrepreneurs (16.8 percent). The results of the U.S. media’s depiction of Mexico showed that in 75 percent of the articles, the North American Free Trade Agreement (NAFTA) was mentioned as the savior of Mexico’s economy. Many of the articles (75 percent) depicted the U.S. as the ideal and the American Dream as the goal of Mexico’s general population. In conclusion, dominant U.S. media depictions of female maquiladora workers are utilized to mask the larger issue of the power dynamics between Mexico and the U.S. The L.A. Times demonstrates the strategic use of media in order to enable its
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2013
Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

201  12:00 pm
The Endangered Nahualt Language of the Low Mountain Region of Guerrero, Mexico: The efforts and challenges by Indigenous teachers to reclaim and revitalize the language
Velma Calvario, Anthropology (M)
Ramona Perez, Anthropology

Linguistic homogenization through educational and cultural policy endangers and contributes to the disappearance of Mexican indigenous languages. This exploratory paper moves beyond an analysis of the language ideologies that have shaped such policies by examining how language shift is being resisted and countered. Utilizing a qualitative research method, including archival research, interviews, and participant observation, this paper looks at the endangered Nahualt language in the lower mountain region of Guerrero, Mexico and what indigenous teachers are doing to empower a Nahua identity in an effort to maintain, reclaim/revitalize, and develop the language.

202  12:15 pm
Exploring A New Era of Corporate Involvement in Latin American Education
Charles Whitney, Anthropology (M)
Ramona Perez, Anthropology

In many places in Latin America, public education is failing to adequately address important problems in education amongst individuals from low socio-economic backgrounds, indigenous populations, and other marginalized groups. Together, international markets and global corporations are driving renewed efforts to produce educated citizens that can contribute towards the building of competitive regional markets. Corporations are becoming increasingly involved in public education, representing a deviation from the traditional government centered education policies typically found in Latin America. Corporate involvement represents a new era in education where public funding is being supplanted by corporate funds. Currently there is a gap in the research that critically analyzes the interests and funding techniques of these corporations. My research seeks to understand the implications of the involvement on corporations on vulnerable populations while exploring the possible interests of these groups.

This literature review examines research that provides an important step in understanding how corporate funding can most effectively be used to accommodate additional training for teachers and students throughout Latin America.

Session B-4
Oral Presentation:
Undergraduate Research in Psychological Science
Friday, March 8, 2013, 11:00 am
Location: Love Library 410

203  11:00 am
Dating Violence: Do Attachment Styles Relate to Retaliatory Responses to Partner Conflict?
Shaghayegh Moin, Psychology (U)
Emilio Uolla, Psychology

Intimate Partner Violence (IPV) is defined as physical, sexual, and/or emotional/psychological abuse within a romantic relationship. Literature indicates that attachment styles play an important role in, and are correlated with, multiple aspects of romantic relationships in adulthood, including relationship aggression and conflict resolution styles (Bookwala, 2003). The focus of the present study is to examine the association between attachment styles and retaliatory responses to conflict. In particular, the current study looks at anxious and avoidant attachment styles and how they correlate with perpetrator responses to conflict. It is hypothesized that those who endorse anxious and avoidant attachment styles will be more likely to engage in retaliatory responses to conflict (RRC). A total of 458 students (aged 18-24) from San Diego State University participated in this study. Participants were recruited from multiple psychology classes. The questions were administered through an online dating-behavioral survey, examining variables relating to family conflict, past abuse, and shame, among others, to analyze multiple predictors of IPV. Attachment style was measured using The Experiences in Close Relationships Scale (ECR). The ECR contains two 18-item scales measuring two dimensions of attachment (avoidant and anxious). Items included in the attachment avoidant dimension highlight lack of closeness and emotional suppression. The attachment anxiety dimension measures fear of abandonment and anger about separations. The RRC consisted of 26 questions used to determine whether certain conflict resolution behaviors were in retaliation to initial abusive behaviors from their partners. Results revealed a significant correlation between both anxious and avoidant attachment styles and eight of the retaliatory responses to conflict. The strongest significant correlation between anxious attachment and RRC involves spiteful acts against a dating partner (r = .206). Avoidant attachment is most significantly correlated with the physical act of kicking one’s partner during a conflict (r = .130). Seventy-nine out of the 91 participants who endorsed pushing or shoving their dating partner (which correlated with both anxious and avoidant attachment)
ABSTRACTS

204 11:15 am
Adolescents’ Coping Strategies and Parenting Behaviors in a Sample of Offspring of Parents with a History of Depression
Carl Bolano, Psychology (U)
V. Robin Weersing, Psychology

Depression is debilitating and distressing to people who are both directly and indirectly impacted by the disorder. Parental depression is one of the predictors and risk factors of elevated youth depression. One way in which depression may be transmitted is through parenting practices, including less positive involvement and greater psychological control. These parenting practices may in turn impact youth’s ability to cope with stress. Understanding the link between parenting behaviors and youth’s coping abilities could provide information useful in developing more effective prevention programs for adolescent depression. In the present analyses, we will examine the relationship between youth-report of parenting strategies and coping styles. Youths in the present sample were enrolled in a multi-site randomized control trial of the prevention of depression in adolescents, aged 13-17, offspring of parents with history of depressive disorder (N = 316). We hypothesize that greater levels of parental acceptance will be associated with greater use of adaptive primary and secondary control coping. In contrast, we expect that high psychological control will be associated with greater use of poor coping skills. Bivariate correlations within the baseline data were examined. Preliminary findings suggest that when parental acceptance is high, youths use higher levels of primary (r = .188, p = .004) and secondary control coping (r = .134, p = .042) and less disengagement coping (r = -.212, p = .001). When parents demonstrate higher levels of psychological control, youths show greater engagement in poor coping mechanisms, namely disengagement (r = .397, p < .001), involuntary disengagement (r = .343, p < .01), and engagement (r = .366, p < .001). These initial results support the importance of examining direct relationships among predictors associated with increased risk of youth’s depression to better understand the effective ways of treating and evaluating parents and adolescents.

205 11:30 am
The Influence of Nature Meditation on Self-Construal, Subjective Well-Being, Mindfulness and Motivation Toward Environmentalism
Sean-Kelly Palicki, Psychology (U)
Sara Unsworth, Psychology

Research exploring mindfulness has flourished in the past few decades, as has interest in cultivating a sense of environmental responsibility. Previous research has provided evidence for a relationship between meditation, mindfulness, concepts of self-nature interconnectedness, pro-environmental orientation, and subjective well-being (Howell, Dopko, Passmore, & Buro, 2011; Jacob, Jovic, & Brinkerhoff, 2009; Schultz, 2000). Other research has shown that experience in nature is also related to mindfulness, self-nature interconnectedness, pro-environmental orientation, and subjective well-being (Chawla, 1999; Kjellgren & Buhrkall, 2010). However, very little research has systematically compared the causal influence of meditation and nature experience. In the present research, two studies were conducted in Buddhist and secular contexts. In Study 1, Buddhist meditators completed surveys during a nature retreat. Results showed positive correlations between mindfulness, self-nature interconnectedness, and autonomous motivation toward environmentalism. In Study 2, undergraduate and graduate students were randomly assigned to four conditions that varied in the presence or absence of meditation and nature experience. Participants completed surveys at the beginning and end of the study. The results showed that meditating in nature had a significant and substantial influence on self-nature interconnectedness, and that this effect was stronger than simply being in nature or simply meditating. In addition, participants who meditated showed the greatest increase in overall mindfulness. Changes in mindfulness were related to changes in autonomous motivation toward environmentalism, bio-dependent self-construal, and subjective well-being. These findings pave new ground in both meditation and environmental research by demonstrating causation and by showing that the combinatorial influence of meditation and nature is greater than that of either experience alone. As all people have the right to a live in a healthy environment, this research can aid in efforts to promote social justice by improving environmental awareness and responsibility.

206 11:45 am
Examining the Relationship Between Perceived Stress and Rumination
Taylor Davine, Psychology (U)
Terry Cronan, Psychology

Rumination, or thinking obsessively about your problems, has been found to predict and prolong various mood disorders, such as anxiety and depression. There are over 200 peer-reviewed
activity restriction exacerbated the relationship between chronic stress and sympathetic nervous system activation.

Jennifer Bordon, Psychology (U)
Terry Cronan, Psychology

Objective: Caregivers of demented patients are at a high risk for negative health consequences, such as cardiovascular disease (CVD), due to the care they provide. The current study examines the interactive effects of activity restriction (AR) and years spent caregiving on plasma catecholamine (CATs) levels in a sample of caregivers of individuals with Alzheimer’s Disease (AD). It is hypothesized that levels of AR would moderate the effect of years caregiving on these levels. Method: A sample of 84 caregivers of patients with AD completed a standard assessment battery to measure AR and had their blood drawn and assayed for norepinephrine (NE) and epinephrine (EPI). Overall CATs were characterized by a composite score using equally weighted standardized scores for NE and EPI. Regression was used to determine whether the relations between years caregiving and composite CATs was greater in those with high vs. low AR. Results: A significant interaction was found between years caregiving and AR (p = .034). Post-hoc analyses indicated that years caregiving was significantly associated with CATs when AR was high (p = .012) but not when AR was low (p = .996). Conclusions: Subjective experience of AR can play a role as a predictor for determining risk for detrimental health consequences, specifically CVD risk.

207 12:00 pm

Activity Restriction Exacerbates the Relationship Between Chronic Stress and Sympathetic Nervous System Activation
Jennifer Bordon, Psychology (U)
Terry Cronan, Psychology

Objective: Caregivers of demented patients are at a high risk for negative health consequences, such as cardiovascular disease (CVD), and this risk increases the longer the care they provide. The current study examined the interactive effects of activity restriction (AR) and numbers of years spent caregiving on plasma catecholamine (CATs) levels in a sample of caregivers of individuals with Alzheimer’s Disease (AD). We hypothesized that levels of AR would moderate the effect of years caregiving on these levels. Method: A sample of 84 caregivers of patients with AD completed a standard assessment battery to measure AR and had their blood drawn and assayed for norepinephrine (NE) and epinephrine (EPI). Overall CATs were characterized by a composite score using equally weighted standardized scores for NE and EPI. Regression was used to determine whether the relations between years caregiving and composite CATs was greater in those with high vs. low AR. Results: A significant interaction was found between years caregiving and AR (p = .034). Post-hoc analyses indicated that years caregiving was significantly associated with CATs when AR was high (p = .012) but not when AR was low (p = .996). Conclusions: Subjective experience of AR can play a role as a predictor for determining risk for detrimental health consequences, specifically CVD risk.
Orientation is controllable partially mediated the link between sexual orientation and negative attitudes towards the LGB community. However, only the belief that sexual orientation is controllable and stable partially explained the reasons why conservatives would see LGB individuals as more threatening, but the question still remains: Why are LGB persons perceived as threatening? The goal of the current study was to attempt to “unpack” religious and political conservatism to find a possible causal explanation. A total of 435 undergraduate students completed an online survey that assessed their attitudes and perceived threats surrounding sexual orientation, and demographic information. Previous research has found a link between religiosity and political conservatism and attitudes towards LGB persons. Individuals who report higher religiosity and greater adherence to right-wing ideology typically have more negative attitudes and are less likely to support equality measures for these sexual minorities. Likewise, research examining general attitudinal trends suggests that, on the whole, conservatives tend to perceive more threat from outgroups than do liberals. Based on this research, conservatives may be viewing LGB individuals as more threatening, but the question still remains: Why are LGB groups perceived as threatening? The goal of the current study was to attempt to “unpack” religious and political conservatism to find a possible causal explanation. A total of 435 undergraduate students completed an online survey that assessed their attitudes towards LGB individuals, perception of threat, perceptions of the causes of sexual orientation, and demographic information. Results indicated that religiosity and political conservatism predicted more negative attitudes toward LGB and higher perceptions of threats from the LGB community (including general threat, economic threat, threat to rights and freedoms, and public health threat). Additionally—ultraconservatives (those who were both high in religiosity and political conservatism)—had the most negative attitudes towards and the greatest perceptions of threats from the LGB community. Causal dimensions of sexual orientation partially mediated these relationships. Specifically, the belief that sexual orientation is controllable and stable partially explained the relationship between ultraconservatism and negative attitudes towards the LGB community. However, only the belief that sexual orientation is controllable partially mediated the link between ultraconservatism and perceived threat. These findings highlight the importance of assessing causal dimensions of the individuals’ current group membership, especially when groups vary with respect to the level of controllability for their membership status.

210 11:15 am
What the Voice Tells Us: A Prosodic Analysis of Individual Political Expression
Reed Reynolds, Communication Studies (M)
Peter Andersen, Communication
The human voice is a rich channel of communication. Beyond language, a variety of non-verbal indicators are encoded within the audible sounds of vocalizations. This study seeks to help explain the patterns of vocal manifestations displayed by individuals such as average fundamental frequency, pitch fluctuation, duration of utterances and pitch range. The context of politically oriented expression was chosen due to a current lack of attention to prosodic analysis in that area—especially in relation to the individuals who generate political utterances. While topics of politics are rife with intricacy, they can readily access raw emotions and interact with a number of personally held beliefs. To investigate the way these interactions emerge in human prosody, 58 individuals on the SDSU campus were solicited the week before the presidential election. Their participation included the performance of a variety of scripted and unscripted vocal tasks involving the names of the two presidential candidates, Mitt Romney and Barack Obama. Vocalizations were recorded and analyzed using Praat spectrographic software. A survey was also administered to all participants, assessing a number of variables. Results indicate many significant relationships between the features exhibited in the utterances of vocal tasks, and individual dispositions and attitudinal states. By extending these lines of inquiry forward for future research, vocal signals may be more fully understood as representations of antecedent cognitive, emotive, or neurological conditions, opening more possibilities for these mental states to be predicted by an appropriate application of prosodic analysis.

211 11:30 am
The Combinatory Influence of Culture, Social Support, and Nature Experience on Adolescent Alcohol Use
Daniel Badal, Psychology (M)
Sara Unsworth, Psychology
Latino adolescents are at greatest risk of engaging in underage binge drinking compared to other ethnic groups (NSDUH, 2010), and researchers have argued for the importance of interventions that address cultural and social factors related to underage drinking in minority adolescents (e.g., Beuvaia & Oetting, 2002). However, findings regarding the relationship between
ABSTRACTS

82

STUDENT RESEARCH SYMPOSIUM 2013

In addition, previous findings highlight the importance of nature experience for psychological well-being (Maller, Townsend, Pryor, Brown, & St. Leger, 2006), but the relationship between nature experience and substance use is unknown. In the present research, Latino adolescents (15- to 19-years of age) completed surveys before and after a culturally-based, socially-supportive nature camp. The surveys included Likert scale and open-ended questions measuring enculturation, perceived social support, and perceived interconnectedness with nature, as well as adolescents’ perceptions of the extent to which different aspects of the camp had a positive influence, and their predictions regarding future alcohol use. The results from the surveys showed that there was a combinatory influence of culture, social support, and nature experience on adolescents’ predicted drinking behavior, above and beyond the influence of any one of these factors independently. Ongoing research is being conducted to evaluate other factors that may mediate these effects, such as self-reflection.

212 11:45 am

Sending Signals: Does Experience Increase the Efficacy of Anti-snake Behaviors in Ground Squirrels?

Breanna Putman, Ecology (D)
Rulon Clark, Biology

Many prey respond to predators through visual or vocal displays, presumably to communicate information about themselves (e.g., quality, vigilance). It has been widely suggested that predators will abandon pursuit of the signaler after receiving such displays. However, it is difficult to know the true function of a display without an understanding of how free-ranging prey signal, and how free-ranging predators respond to those signals. California ground squirrels (Otospermophilus beecheyi) exhibit a tail-flagging display that presumably deters rattlesnake (Crotalus oreganus oreganus) predation. Squirrels also heat up their tails when confronting rattlesnakes, which can sense heat, but not when confronting other snake species. Previous research suggests that tail-flagging could communicate vigilance, and that tail heat could magnify this signal for rattlesnakes (enhance the communication). This study investigates the function of the tail-flagging display using natural observations and manipulative experiments on both predator and prey. Squirrels’ response to snakes appears to depend on if they have displayed tail-flagging or not, and their age (pup vs adult). The role of tail-heat and what information it can afford to rattlesnakes is more complicated and deserves additional attention. Further research on this system will shed light onto the circumstances that prompt predators to attack prey, giving us a glimpse at the current selective pressures driving the evolution of prey behavior.

213 12:00 pm

SES and Language Exposure Effects in Early Vocabulary Comprehension

Stephanie De Anda, Language and Communicative Disorders (D)
Margaret Friend, Psychology

The extant literature provides evidence that socioeconomic status (SES) is positively and significantly related to vocabulary development. Similarly, the amount of exposure to a primary language is positively related to vocabulary size, although school-aged children with minimal second language exposure typically have vocabularies within range of monolingual children (Thordardottir, 2011). Much of this research focuses on expressive vocabulary as measured by parent report on the MacArthur-Bates Communicative Inventory (MCDI, Fenson et al., 1993). There are three limitations to our present understanding of the effects of SES and language exposure. First, the effects on earlier-emerging receptive vocabulary are unknown. Second, how language exposure affects parental expectations, and therefore reports, of child language is unknown. Third, whether exposure effects occur with minimal second language exposure before school age is unclear. Together, these limitations militate for assessment of the effects of SES and language exposure on early receptive vocabulary assessed by parent reports and child-performance.

This project investigates the effects of SES and language exposure on MCDI and Computerized Comprehension Task scores (CCT, Friend et al., 2003; 2008; 2012). Participants are 68 children from 15;15 to 18;5 months of age across SES, and with second language exposure between 0 and 20 percent. A separate Analysis of Variance (ANOVA) was run for each measure: CCT, MCDI comprehension, and MCDI production. Results revealed significant main effects of SES (F(1, 64) = 4.14, p = .05) and language exposure (F(1, 64) = 6.9, p = .01) on CCT scores. Conversely, MCDI comprehension scores showed neither SES (F(1, 64) = .6, p = .46) nor exposure effects (F(1, 64) = .07, p = .17). However, an effect of exposure (F(1, 64) = 5.03, p = .03), but not SES (F(1, 64) = 2.1, p = .15), was present in MCDI production scores. Partial correlations reveal that language exposure and SES account for separate variance in MCDI comprehension and production. However, exposure explained variance in CCT scores above and beyond SES (r(66) = 2.2, p = .03). SES and language exposure effects are not artifacts of parent report, but are present in the receptive vocabulary of children with minimal, early second language exposure.
Session B-6
Oral Presentation:
Undergraduate Research in Behavioral Science
Friday, March 8, 2013, 11:00 am
Location: Love Library 261

214  11:00 am
Literature Review: the associations between Latino cultural values and IPV
Marisela Alamillo, Psychology (U)
Emilio Ulloa, Psychology

A high prevalence of intimate partner violence (IPV) has been shown in Latinas. As well as suffering significantly more adverse IPV-related mental health issues than any other ethnic group. Gradually, the interest of culture regarding Latinas and IPV has been taken into account in research. However, there are a few studies conducted about the influence of Latino cultural and IPV, especially those which have examined embedded cultural values such as: gender ideologies particularly marianismo, taboo against talking about sex, familism, respect for authority, fatalism, and shame as associations linked to IPV. The objective of the current study is to summarize what is known in the literature about the association between Latino cultural values and IPV. Preliminary findings have suggested that cultural values and expectations appear to be linked to how Latinas identify and characterize IPV. In addition, findings have implied that Latinas are aware of IPV being common in their communities although it has been disregarded because it is perceived to be part of Latinas’ every day life. Furthermore, consistent themes of shame, self-blame, and fear of disprovable have appeared in the literature. Hence, the literature indicates that cultural values seem to be embedded at a very young age consequently these values along with self-blame are almost inextricable from an individual’s identity making it difficult to simply identify the abuse and unfortunately even keeping Latinas silent. Therefore, understanding the influences of cultural values and the effects it has on IPV in Latinas is essential for future studies to recognize.

215  11:15 am
Hanging on to Home: Psychological Distress Among Brazilian, Dominican, and Mexican Migrants Residing in the United States
Christian Rodriguez, Psychology (U)
Enrico Marcelli, Sociology

Although an extensive body of research suggests that social capital is positively associated with mental health, few studies investigate how international economic, political and personal ties (Waldinger 2008) are associated with psychological distress among foreign-born residents of the United States. We employ 2007 Boston Metropolitan Immigrant Health & Legal Status Survey (BM-IHLSS) and 2012 Los Angeles County Mexican Immigrant Health & Legal Status Survey (LAC-MHSS) data to test whether maintaining ties to one’s home country (e.g., remittances, voting, international networks of reciprocity) is negatively associated with psychological distress among Brazilian, Dominican Republic, and Mexican immigrants residing in the United States.

216  11:30 am
Social Capital, Health Insurance Coverage and Migrant Psychological Distress
Yazmin Canul, Psychology (U)
Enrico Marcelli, Sociology

Research has consistently shown that health insurance coverage rates among foreign-born Latino residents of the United States is lower than that of U.S.-born residents, that those who lack health insurance are less likely to receive needed or routine medical care, and that not being able to receive medical care is one of the most important stressors among Latino immigrants (Carvajal 2012, Marcelli 2004). We investigate whether interpersonal networks of reciprocity or civic group participation (two measures of social capital) mediate the positive association between not having health insurance and psychological distress; controlling for home environment, neighborhood context, and socioeconomic status and other individual characteristics and behaviors. Utilizing 2012 Los Angeles County Mexican and 2007 Boston Metropolitan (Brazilian and Dominican) Immigrant Health & Legal Status Survey data, we estimate that unauthorized migrants were less likely to have health insurance compared to their legal compatriots and more likely to be distressed. Multivariate logistic regression analyses also suggest that those not having insurance are more likely to be distressed, and that social capital partially mediates this relationship. We conclude by discussing how factors in other life domains (e.g., home, neighborhood) influence distress.

217  11:45 am
Perceived Neighborhood Cohesion, Trust in Government and Migrant Psychological Distress
Nayeli Saucedo, Psychology (U)
Enrico Marcelli, Sociology

Research suggests that foreign-born residents in the United States often experience some sort of initial social maladjustment due to language difficulties, cultural differences, and other factors. It has also been found that social capital (eg., civic participation, trust, support, cohesion, and safety) is in fact linked to mental health (Baum et Al 2009). Using the 2012 Los Angeles County Mexican and 2007 Boston Metropolitan (Brazilian and
Health literacy, the ability to read and understand information needed to make health-related decisions, has been associated with numerous health outcomes, such as adherence to cancer screening recommendations. Language preference, a proxy for acculturation, has also been associated with such adherence. For example, Hispanic American (HA) women who prefer English (versus Spanish), suggesting higher levels of acculturation, are more likely to have been screened for cervical cancer. Additionally, cancer worry has been associated with cancer screening behaviors. This study investigated the associations among self-reported health literacy, language preference, and cancer worry in HAs. A community-based sample of HA men and women (N = 851) completed the Cancer Worry Scale, a brief self-report questionnaire that assesses level of cancer worry and its impact on daily functioning. Self-reported health literacy was assessed using a single validated question regarding confidence completing medical forms. Hierarchical linear regression was used to examine if health literacy was a significant predictor of cancer worry, and if language preference moderated this relationship. After controlling for age, a significant main effect (p < .05) was found for health literacy as a predictor of cancer worry, whereby lower health literacy was associated with greater cancer worry. The interaction of health literacy and language preference was not significant. These findings suggest that health literacy is related to cancer worry in HAs; however, English and/or Spanish language preference was not associated with cancer worry. Therefore, interventions aimed at reducing cancer worry, and thus influencing cancer screening behavior, should consider HAs with low health literacy as a high-risk group independently of their acculturation status.

Individuals with developmental disabilities are at a higher risk for developing psychiatric disorders, as compared to individuals without developmental disabilities. To date, attempts to lower the prevalence of psychiatric disorders in adolescents with developmental disabilities have been inadequate. The current study investigates the effectiveness of three common therapeutic interventions in an adolescent’s psychological state. The interventions examined include augmentative and alternative communication (AAC), occupational and physical therapy, and creative arts therapy. It was hypothesized that a multidisciplinary approach to intervention types is more effective than a single disciplinary approach in shielding against psychological disorders. Participants in this case study included fifteen low-functioning 16 to 20 year olds in a Special Education school in Ciudad Quesada, Costa Rica. Data were collected through participant observation and qualitative interviews over the course of a four-week internship. Therapeutic interventions were administered and extensive notes were documented daily. Data analysis involved both reflections on the experience and initial impressions of the observations. Data were accumulated, narrowed, and organized to categorize the evidence. Results showed an increase in observed psychological health after each type of intervention, and the three interventions were most effective when used in conjunction with one another. The findings suggest that multidisciplinary therapeutic collaboration is the most effective strategy for prevention of psychiatric disorders in adolescents with developmental disabilities.

The purpose of this research is to explore enculturation, concepts of possible selves, concepts of barriers, and substance use among Latino adolescents. Statistics show that Latino adolescents are at greatest risk of engaging in underage binge drinking compared to other ethnic groups (NSDUH, 2010). Previous research has shown that concepts of positive future selves in adolescence is related to reduced substance use, as well as increased academic achievement (Aloise-Young, Hennigan, & Leong, 2012; Oyserman, Brickman, & Rhodes, 2007). However, very little research has examined the role of adolescents’ own beliefs about barriers in achieving positive outcomes, particularly
for Latino adolescents who are already identified as being at risk for problem behavior. In addition, findings about the role of enculturation in adolescent substance use are mixed. In the present research, Latino adolescents were recruited from a continuation school for students identified as being at-risk of not graduating. Participants responded to survey items measuring past substance use, predicted future substance use, positive and negative future self-concepts, beliefs about pursuing higher education, perceived barriers, and enculturation. The results showed that the adolescents are engaging in substance use, but do not identify substance use as a barrier toward achieving goals. Substance use was unrelated to concepts of future selves, but concepts of future selves were related to academic achievement. In addition, substance use was positively correlated with enculturation. Together, these findings suggest that alcohol use is not perceived as a barrier in future achievement and may even be associated with everyday cultural practices for Latino adolescents who are at risk of not graduating high school.

My findings conclude that the film version must remain in the actor’s mind. It is impossible to block it from one’s consciousness. Both of my directors and Jennifer’s asked us to imitate singing styles, song keys, and choreography from the film versions. Similarly, our costume designers designed many of our outfits to be exact replicas. Reviewers of our work compared us to the star performer who had preceded us, and audiences expected us to satisfy them by not straying too far away from what they expected. The general public rarely knows anything about the original Broadway production. Therefore, you cannot create re-create leading roles made famous on film in an altogether original way. Instead, you have to consider them, learn from them, and build upon them to create something that is uniquely your own.

222 11:15 am

A British “National Experience”: William Alwyn’s Music for The Crown of the Year During the Second World War

Breena Loraine, Musicology (M)
Eric Smigel, Music and Dance

During the Second World War, the Ministry of Information was responsible for sponsoring propaganda films that would elicit feelings of patriotism and confidence throughout the United Kingdom. Between 1941 and 1942, the Ministry of Information and Ministry of Agriculture released a series of four documentary films that feature music by William Alwyn and portray life in rural England throughout the four seasons of the year. These films allude to the “rural myth,” a depiction of Britain’s historical countryside intended to boost morale during the war. This study examines the relationship among the music score, cinematographic images, and voiceover narration in the final film of the series, The Crown of the Year, to clarify the film’s illustration of the myth, which, I argue, related to Britain’s national identity. I claim that the depiction of the myth also engendered nostalgia, prompting the British to reminisce to a “golden age,” a time before modernity or industrialism, a landscape of country churches and homes, and soundscapes of folk music and hymns. The “rural myth” and national heritage illustrated in these films allowed residents to share a “national experience” during wartime, a phenomenon which German film director Leni Riefenstahl claims became possible with film. While scholars have investigated music’s role in propaganda, national identity, and nostalgia during times of war, they have not discussed such aspects of Alwyn’s music for this film in detail. This study draws on literary works, as well as statements by Alwyn and film music historians, to further the understanding of historical issues associated with the film.

221 11:00 am

Playing Musical Theatre Roles Made Famous on Film: An Intimidated Actor Prepares

Kimberly Burns, MFA in Musical Theatre (M)
Rick Simas, Theatre Arts

When a performer plays a musical-theatre role that was made famous by a star performer in the film adaptation of that musical, there can be monumental challenges to “live up to.” There are pressures exerted by the audience, the director, the theatre company, and even the actor himself. As a performer who has played these kinds of roles, I have analyzed my experience of treading the delicate path between creating my own interpretation of the character and meeting the audience’s expectations.

The two musical-theatre roles I have analyzed are Eliza Doolittle in My Fair Lady (made famous by Audrey Hepburn), and Maria von Trapp in The Sound of Music (made famous by Julie Andrews). I have personally played the role of Eliza Doolittle, and I have interviewed Broadway performer Jennifer Hope Wills who played the role of Maria von Trapp. I cite her experience, as well as my own, to support my research. I have analyzed my feelings and experience in creating roles, and thoroughly researched the original musicals to determine whether the film versions are accurate representations of the roles.
Revived On Broadway: Examining the Musicals
A Chorus Line and Chicago
Roxane Carrasco-Wood, MFA Musical Theatre (M)
Rick Simas, Theatre Arts

In 1975, two classics of contemporary musical theatre opened on Broadway: Michael Bennett’s A Chorus Line and Bob Fosse’s Chicago. A Chorus Line garnered the public’s attention and critical acclaim, hit Broadway by storm and remained there for fifteen years, while the other, Chicago, had a modest run and closing after a relatively short run of two years. More than two decades later, both shows would be revived on Broadway, both seemingly authentic recreations of the original director-choreographers’ vision, but this time with almost the exact opposite results. The Broadway revival of A Chorus Line was received with mixed reviews and closed after two years, winning no awards, while the revival of Chicago was a huge critical success, winning multiple awards, and is now the longest-running revival in Broadway history. It is still playing at the Ambassador Theatre today. This essay examines the factors that went into the process of creating these musicals, the artistic teams involved in their creation, and their critical and commercial success as documented in reviews and by length of run for both shows in both decades. I seek to discover why these musical revivals had completely different outcomes than their original counterparts.

Evolution of the Role of Dance Captain in Musical Theatre Productions
Jill Gorrie, Musical Theatre (M)
Rick Simas, Theatre Arts

Dance captains, who are perhaps the least known or acknowledged members of a musical-theatre production team, are often the hardest working. Their importance has grown exponentially with the advent of long-running musicals and the technical demands of contemporary musical-theatre choreography. Relatively little has been written about the role of the dance captain in musical theatre, when it was formalized, and how the duties were handled before it was created. This paper traces the origins and evolution of the dance captain, detailing the responsibilities of the position, in particular, the responsibility for maintaining the integrity of the choreographer’s work throughout the run of a show, and the prodigious job of teaching the choreography to understudies and new cast members. It documents the work of current and former dance captains such as Troy Garza (A Chorus Line) and Theresa Nguyen (Disney’s The Lion King), in an effort to shed light on this important, yet largely unknown member of the artistic team, and the impact that he or she has on the overall success of musical-theatre productions.

Gender Rebellion in Rock: Examining Courtney Love and Liz Phair as Maxims of Third Wave Feminism.
Linnea Zeiner, History (U)
Eve Kornfeld, History

Courtney Love and Liz Phair represent two icons from a unique period of rock when feminist ideals commandeered the airwaves and female singer-songwriters were rewarded critically and commercially for their bold performances. Courtney and Liz as individual artists stand as pioneers of this movement through their two albums: Live Through This (1994) and Exile in Guyville (1993). They derailed gendered norms of “male” and “androgynous” behavior, by dramatically altering established psychosexual aspects of rock. Their sexually explicit lyrics, primal vocal sounds, avant-garde performance styles, and even the chords and rhythms of their music, were all brave new expressions of Third Wave Feminism that transgressed across gendered norms of behavior while reclaiming and redefining rock for women in lyrical themes of gender violence, rape, reproductive rights, and love, from a place of both strength and vulnerability.

This project required a diverse analysis method that became three dimensional, employing various platforms of sight, sound, and scholarship. Through multi-sensory observation of the artists, utilizing foundational post-colonial repressive theory, gaining first-hand interviews from Courtney Love and Liz Phair from Rolling Stone, and insight from prominent Third Wave Feminist Jennifer Baumgardner and other scholars, this examination was able to use music as a viable vessel for gender interpretation. Serving as the sexual sounding board and the feminist infrastructure of the research was Michel Foucault’s History of Sexuality Vol. 1 (1978) Vol. 2 (1985) and Discipline and Punishment (1977).

The female gender rebellion of Courtney Love and Liz Phair boldly transgressed against sexual repression and patriarchal traditions in rock. They were able to create a gender paradox that was continually reflected through other Grunge and Alternative female artists for the duration of the 1990s. The new feminist identity in rock manifested a violent resistance to repression and simultaneously opened up a new gendered configuration of “maleness” and “femaleness” as distinct polarities within one loud, sexy, tough, and talented aesthetic. In this way, these two successful singer-songwriters were critical in the catapulting of Third Wave Feminism to a new height of acceptance.
Gender Discrimination: Women in Rock Music
Sherry Boulter, History (U)
Eve Kornfeld, History

The first generation of women in rock and roll music in the 1960s experienced a boys’ club and were expected to drink, use drugs, and be promiscuous like their male counterparts. I wanted to discover if the women in rock music in the 1970s and 1980s experienced sexual discrimination to the same degree as women in the first generation of rock music did. Secondary sources by Sheila Whiteley, Judy Kutulas, and Lisa Rhodes provided valuable historical context about the level of discrimination faced by the first generation of women in rock and roll. For my research I conducted two oral interviews with local artists. These local musicians were vocalist Laurie Beebe-Lewis who sang with the New Mamas and the Papas as well as the Buckinghams, and lead guitarist and song-writer Roni Lee who played with Venus and the Razorblades and co-wrote the song “I Wanna Be Where the Boys Are” which was featured in the 2010 movie The Runaways. I used the memoirs In Between a Rock and a Heart Place: a Memoir by Pat Benatar and Patsi Bale Cox and Kicking and Dreaming: a Story of Heart, Soul, and Rock and Roll by Ann and Nancy Wilson of Heart which gave personal accounts of their experiences. Articles from Rolling Stone magazine were included to show how the male dominated press responded to women in the industry.

The research revealed that men in the music industry used constructed labels to assert their dominance and demean women. Sexual harassment was prevalent and reinforced the imbalance of power. Women were treated as novelty acts to bring attention to men in the groups and their images were sexualized for the sexual gratification of men. Women responded to this treatment by writing songs, refusing to follow orders, and sometimes becoming physically aggressive when subjected to harassment. Artists such as Pat Benatar and the Wilsons of Heart reached the top of the charts, but it was not an easy thing to do. Their success was far from typical in the male dominated music industry.

The Early Female Cultural Identity in Hip-Hop, 1975-1985
Etiene Andrade, History (U)

During the late 1980s and 1990s, a wave of female rappers began to appear on the mainstream charts of Hip-Hop and Rap music. Their emergence represented an alternative cultural space where the lyrical discussion was aimed towards women’s issues and attitudes in Hip-Hop music. Artists like Queen Latifah, Salt-N-Pepa, and MC Lyte opened a musical and cultural space where they could talk about men’s misogynistic attitudes and called for women’s empowerment. This research illustrates the ways early female rappers from the mid-1970s and mid-1980s developed their own cultural identity in a male dominated cultural scene within a marginalized urban setting in New York City.

Secondary sources used in this project were Tricia Rose’s “Never Trust a Big Butt and a Smile” and Cheryl L. Keyes’ “Empowering self, Making Choices, and Creating Spaces,” among others. They exposed the way female rappers from the late 1980s and 1990s developed a cultural space for the young female community. Primary sources were oral histories from the artists themselves which illustrates the characteristics and experiences of female rappers during the formative years of Hip-Hop culture. The oral histories were taken from the book called Yes Yes Y’All by Jim Frickie and Charlie Arhean and the online site called ThaFounda-tion where Hip-Hop fanatic JayQuan interviews early Hip-Hop artists. Secondy, lyrics from female rappers like Sharon Jackson “Sha-Rock,” Pebble Poo, Roxanne Shante, and Sparky D were analyzed in order to illustrate the components of their identity.

The main conclusion is that early female rappers did develop a cultural identity that opened up an opportunity to represent young black women living under the similar social and urban conditions. The characteristic that differs their cultural identity from rappers of the 90s is the absence of gendered lyrics. Early female rappers elaborated a cultural space through a “Fly-Girl” identity that promoted a Hip-Hop womanhood based on boastful tones, skilled competition, and battle rhymes, but not gendered issues. It was through action and performance, not through a public discussion, that these rappers empowered young female listeners and future female rappers.

What if Dante had an 808?: Tupac and Humanism’s Dolce Stil Novo
Holly Puccino, MALAS (M)
William Nericcio, English and Comparative Literature

Renaissance Humanists felt that the religious wars and political unrest of the thirteenth century was the result of religious fanaticism, extremism and social intemperance. This discontent with modern society resulted in an environment described as full of complex intellectual construction and technical achievements in the form of literary and philosophical movements. This turmoil divided many cities and scholars. One of the heart centers of this struggle was Florence, in central Italy. The young academics of the city, especially Dante Alighieri, found solace for the violent territorial wars and proclaimed the failings of the medieval church with what, I would say, was their version of Hip Hop: a “dolce stilo novo”. Unlike any poetry ever written before, this prolific vernacular style and transcendent universality has influenced the likes of Tupac Shakur. Hip Hop, at its roots, is a descendant of the Renaissance practice of rapping in vernacular, a remixed and new style of conveying poetry with creatively
and specially engineered beats. In this paper I intend to explore the transcendent qualities of Italian Renaissance Humanism and the dolce stil novo and how those qualities are translated and present in modern African American Humanism as it is described by credible analysts like Anthony Pinn and Eric Michael Dyson, and in the work, life, and musings of Hip Hop artist Tupac Shakur. The primary qualities I would like to bring to light for this project are some of the thematic, stylistic and rhetorical devices used commonly in the artistic work of the two ages.

Session B-12

Poster: Microbiology II
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

229 Poster #1 11 am-12:45 pm
Coxsackievirus Infection of Neural Stem and Progenitor Cells, Alterations in Stem Cell Function, and Accelerated Disease Progression in a Mouse Model of Alzheimer’s Disease
Alicia Zamudio Montes de Oc, Biology/Psychology (U)
Ralph Feuer, Biology

Coxsackievirus B3 (CVB3) is human pathogen that can leave serious, long-lasting alterations in the central nervous system (CNS) of the surviving host. Our laboratory has characterized the ability of CVB3 to persist in the CNS in our pediatric model of infection and to preferentially target neural progenitor and stem cells (NPSCs). We wish to examine the effects of a persistent CVB3 infection in hAPP751 transgenic mice, a mouse model for Alzheimer’s disease (AD). These mice express the amyloid-β protein under the murine Thy1 promoter and reproduce some aspects of AD pathology observed in patients, such as widespread neurodegeneration in the cerebral cortex and accumulation of amyloid-β protein in the form of plaques. hAPP751 transgenic mice infected with CVB3 shortly after birth showed increased mortality, as compared to either infected non-transgenic littermates or mock-infected hAPP751 transgenic mice over a 7 month period. We hypothesize that fundamental molecular changes in neurons from persistently-infected hAPP751 transgenic mice, including alterations in autophagy and axonal transport, may accelerate the progression of a subsequent neurodegenerative disease in our in vivo AD model. To assess this hypothesis, neural stem cells were successfully isolated from the cortices of three-day-old hAPP751 mice and cultured to form neurosphere aggregates. NPSCs derived from these primary cell isolations were infected with a recombinant CVB3 expressing the enhanced green fluorescence protein (eGFP-CVB3). Infected hAPP751 NPSCs and NPSCs derived from non-transgenic littermates are currently being monitored, and the number of viable cells are being quantified using trypan blue staining. Following the establishment of a persistent infection NPSCs will be differentiated and observed for alterations in cell lineage commitment and neuronal or glial cell function. In addition, autophagic flux will be monitored in neurons derived from persistently-infected NPSCs utilizing tandem mRFP/mCherry-GFP-tagged LC3 in combination with fluorescence microscopy. Our preliminary results suggest that a previous neurotropic infection which persists in the host may accelerate the progression of a subsequent neurodegenerative disease by altering neural stem cell function.

230 Poster #2 11:00 am-12:45 pm
Previous Coxsackievirus Infection Restricted T cell Migration into the Central Nervous System and Reduced Signs of Disease in a Mouse Model of Multiple Sclerosis
Laura McIntyre, Microbiology (U)
Ralph Feuer, Biology

Coxsackieviruses are members of the Picornaviridae family and enterovirus genus. These viruses are associated with a number of acute and chronic diseases in humans, including pancreatitis, myocarditis, diabetes, and aseptic meningitis. Our recent studies suggested that the coxsackievirus B3 (CVB3) serotype preferentially targeted and injured neural stem and progenitor cells in the developing central nervous system (CNS) and established a persistent infection. Also the choroid plexus, which regulates the blood-cerebrospinal fluid-barrier (blood-CSF-barrier), was disrupted during acute CVB3 infection. Our laboratory investigated the effects of a persistent CVB3 infection on a subsequent demyelinating disease. We utilized the experimental autoimmune encephalomyelitis (EAE) model (mouse model for multiple sclerosis) whereby immunization with a myelin peptide leads to the infiltration of pathogenic CD4+ T cells into the CNS with ensuing demyelination. Unexpectedly, mice previously infected with a recombinant CVB3 expressing the enhanced green fluorescence protein and immunized with myelin peptide were protected from signs of disease. Protection from EAE-induced disease correlated with a restriction of pathogenic CD4+ T cells expressing interferon-γ from entering the parenchyma of the brain. These results suggest that a previous neurotropic infection which persists in the host may reduce a subsequent neurological disease. Alterations in the blood-CSF-barrier during persistent CVB3 infection may be an important determinant for the reduction of EAE disease.
231  Poster #3  11:00 am-12:45 pm

**The Role of MicroRNAs in Human Embryonic Stem Cell Survival**

Cullen Pivaroff, Biology (U)
Ricardo Zayas, Biology

MicroRNAs (miRNAs) are short non-protein coding RNA that have been shown to post-transcriptionally regulate gene expression in animal cells. It is believed that miRNAs negatively regulate gene expression by interacting with messenger RNA (mRNA) and promoting either translational repression or mRNA for degradation through the RNA-induced silencing complex. There is evidence that miRNAs are vital in many cellular processes including: development, the cell cycle, survival and apoptosis, and cancer. It has been suggested that each cell type and tissue expresses a unique and characteristic combination of active miRNAs. Yet the biological role of miRNAs in human embryonic stem cells (hESCs) and the exact mechanisms and pathways in which they work remain largely unknown. It has been hypothesized that miRNA families highly expressed in hESCs may play a critical role promoting attributes characteristic to stem cells, such as, self-renewal and pluripotency. miRNAs may also play a substantial role in differentiation events, cell survival, and perhaps, may have application in reprogramming. Knockdown experiments of miRNAs hsa-miR-302a and hsa-miR-525-5p provided evidence that these miRNAs may be implicated in cell survival. When these miRNAs were inhibited, apoptosis was observed by way of microscopy and an apoptosis assay using terminal deoxynucleotidyl transferase dUTP nick end-labeling (TUNEL). To explore this phenomenon, potential genes regulated by hsa-miR-302a and hsa-miR-525-5p were identified by a target prediction program (TargetScan) based on sequence. An apoptosis pathway map of potential miRNA targets was created to depict each target’s potential role in promoting or inhibiting apoptosis. To experimentally determine the relevant targets, luciferase reporter assays, quantitative real time PCR, and western blot analysis will be used to evaluate target specificity and repression mechanism. A greater insight into the regulatory role of miRNAs in hESCs will add to our understanding of basic cellular biology and may lead to significant advancements in medicine in the future.

232  Poster #4  11:00 am-12:45 pm

**Reengineering the Zinc Finger Recombinase Architecture for Future Stem Cell Therapies and Research**

Ryan Tingle, CMB (U)
Ricardo Zayas, Biology

The future potential of stem cell based therapies is dependent upon the molecular tools available to researchers. Therefore, the development of novel approaches to harness the extraordinary possibilities of stem cells is a necessary undertaking in the advancement of stem cell research. Zinc Finger Recombinases (ZFRs) are enzymes capable of targeted gene manipulation. These chimeric enzymes are constructed by fusing an activated serine recombinase catalytic domain to a userdefined zinc finger DNA-binding domain. The enzymatic activity on the DNA sequence is dependent upon dimerization of ZFR pairs, however, variations in ZFR pairings can contribute to DNA catalysis of off-target sites in the genome resulting in cytotoxicity and cell death. We addressed this problem by targeting specific regions of the enzyme for reengineering so the new architectures would favor one desired ZFR dimer possibility. We created ZFR obligate heterodimers which form through engineered repulsions from specific amino acid replacements found through rounds of mutagenic PCR and antibiotic selection. Expression levels of ZFR variants were compared to wild type ZFRs using Western blotting, with no significant effect on enzyme expression levels being detected. This suggests that the mutations do not affect the enzymes expression levels. The mutations which cause the enzyme to favor heterodimerization may also lower its activity, therefore, amino acid substitutions were introduced into the enzyme in an attempt to restore lost activity. Rounds of overlap PCR was used to incorporate new single amino acid mutations into the enzyme, followed by transfection into HEK293T cells for analysis of ZFR activity via Luciferase assay. As the specificity of these enzymes is increased, thus decreasing toxicity due to offtarget genome rearrangements, we continue the development of these DNA modifying enzymes which may contribute to the creation of novel tools for genetic engineering and DNA modification of stem cells.

233  Poster #5  11:00 am-12:45 pm

**Genetic Barcoding for High Throughput Capabilities in Mammalian Cells**

Yen Lam, Biology (U)
Roland Wolkowicz, Biology

Retroviral technology allows for the stable expression of genes of interest in a wide range of eukaryotic cells. A major advantage of using viral particles is their ability to deliver genes into active sites of transcription, as part of the natural life cycle of retroviruses. As the information the viral particle carries is integrated in the genome of the host, one can exploit this property for genetic engineering of mammalian cells. One application of this technology is genetic bar-coding; the manipulation of cells so each one bears its own signature.

Here several retroviral vectors carrying different fluorescent proteins were used for mammalian cell genetic barcoding. We have chosen fluorescent genetic barcoding as it allows for the identification and tracking through long periods of time in an easy and straightforward manner. Following a process of transfection and amplification of individual clones using fluorescent activated cell sorting (FACS), we have obtained a series of SupT1 cell clones, a T-cell line that carry a fluorescent protein that distinguishes them from its counterparts. The fluorescent protein
chosen have a distinctive absorbance/emission spectrum with minimal spectral overlap, so they are easily distinguishable from each other. This property allows for the simultaneous analysis of the distinct cells in the same sample, referred to as in flow-cytometry jargon; multi-parameter analysis. Here, we present one such multiplexed systems based on two fluorescent proteins (E2 Crimson and tdTomato) at different intensities (low, medium and high), obtaining a matrix of distinct populations. Importantly, when analyzed in the same sample, the bar-coded cells can be easily de-convoluted, or tracked back through FACS.

Multiplexing through genetic barcoding enables the simultaneous analysis of multiple cells by flow cytometry, drastically enhancing high throughput capabilities and versatility. Different mammalian cells will be used, including SupT1, 293T, and Huh 7.5.1 cells, to show the adaptability to other cell types. This method eliminates the need for antibody staining, drastically decreasing time, increasing signal-to-noise ratio, and decreasing costs. The cell-lines can be used in many different laboratories in a straightforward manner, and thus, will be a great tool for molecular cell biology and biotechnology.

**234** Poster #6 11:00 am-12:45 pm  
*Crystal Structure Based Library of new Small Molecules Active against the Hepatitis C Virus (HCV)*

Amanda Siracusa, Biochemistry (U)  
Mikael Bergdahl, Chemistry and Biochemistry

Hepatitis C virus (HCV) has infected some 200 million people worldwide and is a major threat to human health. The Interferon-alpha/ribavirin treatments of HCV are unfortunately associated with serious side effects and are effective only in few cases. Recently a new class of small drugs was recently discovered that act against HCV in a new way, binding to a part of the highly conserved 5' untranslated region of the viral RNA. We reported a novel synthesis and crystal structure of one of these molecules bound to the viral RNA. Our synthetic route offers higher unprecedented access to new and highly optimized drugs against HCV. By utilizing information gained from the crystal structure, we are able to direct our synthesis towards molecules with a higher probability of increasing potency of our novel compounds. Our library currently has three directions for increasing affinity; to make conformationally restricted analogs, to change ligands that will optimize amine-phosphate salt bridges seen in the crystal structure, and to utilize space in the binding pocket for aryl ring substitutions. New compounds will be crystallized with the HCV RNA and the crystal structure obtained. They will also be tested against the IRES-IIa subdomain, allowing us to iteratively refine SAR. As a result, the key innovation of attaching variable side chains at a late stage in our synthesis, and crystal structure of our compound bound to the RNA, has afforded us the ability to rapidly synthesize derivatives expected to have increased potency over our initial compound. Some compounds having HCV-inhibitory effect have already been submitted for assay with more on their way through the pipeline. Novel compounds will be presented along with assay data. We have concluded that the crystal structure of our initial compound bound to the RNA has made it possible for us to synthesize a highly targeted group of compounds predicted to greatly increase potency of new anti-HCV medications.

**Session B-13**  
Poster: Undergraduate Research in Brain Science  
Friday, March 8, 2013, 11:00 am – 12:45 pm  
Location: Library Dome

**235** Poster #7 11:00 am-12:45 pm  
*Inactivation of the interoceptive insula suppresses chemosensory cue reactivity to ethanol following chronic ethanol exposure*

Carlo Quintanilla, Psychology (U)  
Susan Brasser, Psychology

Recent findings indicate that the insular cortex (i.e., limbic sensory cortex) is critically involved in addictive behavior to multiple drugs of abuse by regulating an organism's responsiveness to drug-associated sensory cues that trigger craving or "urge to use". Damage sustained to the insula in addicted smokers results in a disruption of nicotine addiction and pharmacological inactivation of the insula in rodents disrupts conditioned preference for environments previously paired with amphetamine or nicotine and prevents or suppresses cue-induced reinstatement of nicotine and cocaine-seeking. Human imaging studies have demonstrated activation in the insula during the experience of drug-related craving and exposure to drug-associated cues, including the taste of alcohol in heavy drinkers. The present study measured chemosensory responsiveness to ethanol in chronically ethanol-exposed or naive rats under conditions of pharmacological “silencing” of the caudal granular/dysgranular insular cortex to directly examine the role of this brain region in mediating responses to ethanol-associated sensory cues. Outbred Wistar rats were initially exposed for five weeks to either a 20% ethanol intermittent access paradigm or were given access only to water. Following implantation of intracranial cannulae, rats from each exposure condition were subsequently tested over five consecutive days for short-term lick responses to ethanol (3–40%) and a water control after receiving bilateral insula infusions of saline or muscimol. Alcohol–experienced rats displayed a concentration-dependent increase in chemosensory avidity for ethanol compared to alcohol-naïve rats, evidenced by elevated lick responses and trial sampling frequency particularly at higher ethanol concentrations (15–40%). Inactivation of the insula eliminated this concentration-dependent response...
in chronically exposed animals, with total licks to ethanol and water not differing, which was driven primarily by a decrease in number of ethanol trials sampled. Insula inactivation did not modify orosensory responses to ethanol in alcohol-naive animals. These data support insular cortex involvement in mediating responsiveness to conditioned alcohol chemosensory cues following chronic association of ethanol’s taste and post-absorptive effects. A complementary study is currently investigating changes in neuronal activation patterns within the insular cortex in response to alcohol chemosensory cues following chronic experience with the drug via measurement of c-fos expression, a common marker of neuronal activity.

236  Poster #8  11:00 am-12:45 pm

**Exploration of Source Memory in Parkinson’s Disease Patients**

Savanna Tierney, Psychology (U)
Paul Gilbert, Psychology

Parkinson’s Disease (PD) is a neurodegenerative disorder characterized by motor, cognitive, and psychiatric symptoms. These symptoms are associated with a variety of adverse functional impairments in daily living. The frontostraital circuits are neural pathways that interconnect regions of the frontal lobes and the basal ganglia that facilitate motor and cognitive function. Research shows that the frontostraital circuit is disrupted in PD and is believed to result in this trifecta of deficits. Source memory refers to the origin of information, the ability to remember the context from which specific information was acquired. Source memory is often contrasted with item memory, which is memory for content or facts irrespective of its source. Past research indicates that patients with frontal lobe lesions show normal item memory but demonstrate decreased source memory. Despite well-established frontal lobe dysfunction associated with PD, few studies have examined source memory in this population. Two past studies have revealed contradicting results. Hsieh and Lee (1989) found a lack of source memory deficits in PD patients while a study by Drag et al. (2009) found that, individuals with PD show impairments in source memory compared to normal participants. In the current study, 30 individuals with PD and 25 demographically similar normal controls were administered a source memory task. The task consisted of a series of objects that were presented to participants as either a written word or a picture. To assess measure of source memory the names of a series of objects were presented verbally one at a time and participant was asked to indicate the source in which each item was presented (e.g. a word or a picture). It was hypothesized that participants with PD would show impaired source memory compared to controls. However, the data revealed that performance on the source memory task did not differ between the PD and control groups. Despite documented evidence that the frontostrial circuit is disrupted in PD, the results of this current study do not show deficits on the current source memory task shown to be dependent on frontal lobes. These findings do not support the initial hypothesis; however, the data do support previous research indicating that PD does not negatively affect source memory function.

237  Poster #9  11:00 am-12:45 pm

**Gender Difference in Targeting Performance can be Eliminated by Reducing Conscious Analysis of Ball Movement**

Callie Warren, Psychology (U)
Paul Gilbert, Psychology

Gender differences favoring males are well-established in spatial tasks involving real or imagined movement. Electrophysiological and imaging studies indicate that the difference arises from gender-related processing biases. The male bias relies on unconscious, bottom up processing of movement by the brain, whereas the female bias relies on a top down strategy that involves moment-to-moment conscious analysis. In these experiments, we sought to eliminate the gender difference in targeting by forcing females to use a bottom-up strategy. We used a computerized targeting task where participants observe a ball moving vertically at various angles from the bottom of the screen toward a horizontal line. The ball disappears beneath a masking screen before reaching the line. When the invisible ball passes through the line, a paddle appears on the line and participants click on the estimated point of intersection. We employed an egocentric and an allocentric perspective since the two perspectives involve distinct, but overlapping parietal lobe circuitry. In the egocentric perspective, the ball moves vertically from the participant’s body toward the line. In the allocentric perspective, the vertically moving ball is angled to bounce off a side wall before going toward the horizontal line. To eliminate the top-down processing bias in females, we used a fast moving, small ball, thereby making it difficult to consciously perform an online conscious analysis of movement. We tested 20 males and 27 females under the egocentric and allocentric perspectives using 4 conditions: 1) large ball/slow speed; 2) large ball/fast speed; 3) small ball/slow speed; and 4) small ball/fast speed. As expected, males performed significantly better than females in the egocentric condition using a slow ball speed or a large ball with a fast speed. However, combining a small ball with a fast speed eliminated the gender difference, as predicted. In the allocentric condition, we were not able to eliminate the gender difference. These results show that when females use bottom-up processing they perform similar to males in the egocentric, but not the allocentric perspective. This suggests that different, or additional, cognitive processes are involved in the sex difference in allocentric spatial processing related to targeting.
238  Poster #10  11:00 am-12:45 pm
Effects of Cultural Knowledge on Parallel Language Activation in German-English Bilinguals
Sebnem Uzuner, Psychology (U)
Henrike K. Blumenfeld, Speech, Language, and Hearing Sciences
Previous studies have shown that bilinguals activate their two languages simultaneously during spoken word recognition (Blumenfeld & Marian, 2007; Marian & Spivey, 1999). The current study investigated whether and how top-down conceptual processing influences such parallel language activation. Cultural knowledge was used to manipulate semantic activation in German while German-English bilinguals listened to English words. Parallel language activation was measured using eye-tracking. Participants were presented with visual displays containing four pictures: a target item, a competitor item, and two unrelated filler items. Twenty-four trials contained a target item that was culturally meaningful to individuals who grew up in Germany as well as a German competitor item that had some word-initial phonological overlap with the target word. For example, when presenting the auditory stimulus “cake,” the picture display contained an image of a Black Forest Cake (which should be culturally meaningful to German-English bilinguals) and the German competitor item Kellner (= waiter). Twenty-four trials contained a culturally neutral item presented with a German competitor item. The remaining 48 trials were filler trials. All participants also completed standardized tests to assess their language and cognitive skills, and bilingual participants additionally completed a questionnaire assessing their affiliation and level of identification with German culture. We hypothesized that German-English bilinguals would fixate the German competitor items more when presented with a culturally meaningful target than with a culturally neutral target. Preliminary data from seven German-English bilinguals (Mage = 24.86, SD = 3.76) and a control group of 10 English monolinguals (Mage = 21.4, SD = 1.96) revealed a competitor effect for bilinguals in the culturally salient stimulus condition only (Wilcoxon Signed-Rank, Z = -2.20, p = .03). Although preliminary, these results suggest that activation of cultural knowledge in bilinguals exerts a conceptual top-down influence on parallel language activation. Our findings contribute to existing research by considering the role of cultural knowledge in the study of parallel language activation in bilinguals.

239  Poster #11  11:00 am-12:45 pm
Odor Identification in Normal Older Adults: the Influence of Statin Use
Catherine Sumida, Psychology (U)
Claire Murphy, Psychology
OBJECTIVE: Background: A number of studies have suggested that statin therapy is associated with a lower risk of developing dementia, specifically Alzheimer’s disease (AD). In contrast, other studies evaluating statin therapy for mild to moderate AD patients found no significant difference between patients and controls on various cognitive assessments. With a projected 16 million American older adults developing AD by 2050, the identification of preventative and early detection measures is of crucial importance. One potential measure that might be considered for inclusion in a neuropsychological battery of tests targeting AD is odor identification because of its association with the progression of AD pathology and the risk of developing mild cognitive impairment symptoms. Objective: To determine whether older adults who are using a statin differ from those who are not using a statin in performance on an odor identification test. Participants & Methods: To address this issue, groups of older adults using statins (N = 14, mean age = 71.86) and not using statins (N = 15, mean age = 70.83) were compared on the San Diego Odor Identification Test while controlling for olfactory threshold, Boston Naming Test and age. RESULTS: Older adults who were using statins identified significantly more odors than those older adults who were not using statins. CONCLUSIONS: The results suggest that for older adults statin use may be associated with a lower risk of olfactory cognitive impairment. Supported by NIH grant R01-AG04085-25 (CM).

240  Poster #12  11:00 am-12:45 pm
A Comparison of Two Paradigms to Assess Spatial Pattern Separation
Dianna Welsh, Psychology (U)
Paul Gilbert, Psychology
Pattern separation is a mnemonic process through which partially overlapping patterns of neural activation are separated into distinct representations. This mechanism may help to reduce interference among memory representations with similar elements, thus facilitating accurate encoding and subsequent retrieval. Recently, experimental tasks have been developed to assess pattern separation in humans, as these tasks may help to detect subtle age-related memory changes. The present study examined memory for spatial location in young adults using two paradigms, both of which are hypothesized to require pattern separation. Both tasks consisted of multiple trials, each with a sample phase followed by a choice phase. During the sample phase for each task, a gray circle appeared briefly on a computer screen and the participant was instructed to remember the location of the circle. The two tasks differed in the task demands for the choice phase. In the delayed-match-to-sample task, two colored circles were displayed simultaneously during the choice phase and the participant was asked to indicate which of the two circles was in the same location as the original gray circle. The two circles were separated by varying increments of 0cm, 0.5cm, 1cm, and 1.5cm across trials. In the recognition memory task, one gray circle was displayed during the choice phase and the
participant was asked to indicate whether the circle was in the same location or in a different location as the original gray circle. The different locations varied by the same increments listed for the delayed-match-to-sample task across trials. In both tasks, the distance between the sample phase circle and the choice phase circle(s) was manipulated to create varying degrees of spatial interference, with the hypothesis that smaller distances would result in increased interference and pattern separation demand. Consistent with this hypothesis, there was a linear increase in performance as spatial distance increased on both tasks. However, on average, participants completing the delayed-match-to-sample task outperformed participants completing the recognition memory task, suggesting that different task demands impact memory performance. These results may have important implications for assessment of memory if pattern separation tasks are extended for use in various clinical populations.

Session B-14
Poster: Graduate Research in Brain Science
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

241 Poster #13  11 am-12:45 pm
MRI Diffusion Tensor-based White Matter Tractography Analysis of Major Association Tracts Following Early Brain Injury
Raymond Covarrubias, Psychology (M)
Pamela Moses, Psychology

Previous research on plasticity and neurocognitive development following unilateral prenatal brain injury has shown profiles of resilience and atypical functional organization that suggest alterations in the underlying anatomical structure of the brain. Specifically, these findings point to a compensatory alteration in organization of the connective fiber pathways within either or both the injured or intact hemisphere that differs from that of typically developing children. However, the location and trajectory of the major association white matter pathways subsequent to prenatal disruption have not been systematically assessed. This study used diffusion tensor imaging (DTI), a magnetic resonance imaging (MRI)-based technique, to identify the location, map the trajectory, and measure the size of the major anterior to poster association fiber tracts in the brains of children with unilateral perinatal brain lesions (PL) to see if there was evidence of overgrowth or rerouting. Four teenagers and young adults with unilateral PL due to middle cerebral artery (MCA) stroke and 15 age- and sex-matched controls were examined. Two of the PL cases had injury to the full perfusion territory while the others had small pericentral lesions. A probabilistic tractography algorithm was used to reconstruct a comprehensive set of fiber tracts including the superior longitudinal fasciculus, inferior occipitofrontal fasciculus, uncinate, and inferior longitudinal fasciculus in both the injured and intact hemispheres. DTI tractography showed disruption of tracts that project to or through the lesion site, as expected. However, in the PL cases there was no evidence of gross alteration in the location or trajectory of the remaining intact tracts within the injured hemisphere or in the tracts within the intact hemisphere. Interestingly this was true of the cases with larger injuries as well as the cases with smaller injuries. Thus there was no large-scale fiber packing, hypertrophy, or redirection of the fiber pathways in the PL cases.

242 Poster #14  11 am-12:45 pm
Remote odor memory in genetically at risk ApoE ε 3/4 and ε 4/4 individuals with Alzheimer’s Disease
Stephanie Oleson, Psychology (M)
Claire Murphy, Psychology

Alzheimer’s disease (AD) is a neurodegenerative disorder characterized by progressive memory impairment and the presence of amyloid plaques and neurofibrillary tangles. The associated neuropathology originates in brain areas responsible for olfaction, which suggests olfactory tasks as useful predictors of early pathology. A strong genetic risk factor for AD is the ε4 allele of the apolipoprotein E (ApoE) that has been associated with increased cognitive and olfactory deficits. Furthermore, homozygous ApoE ε4/4 individuals diagnosed with AD are known to have heightened amyloid burden and a more rapid rate of cognitive decline. Deficits in remote memory retrieval for odors have been demonstrated in patients with AD, but no published studies have examined the effect of the ε4 dose on remote odor memory in AD patients. Remote odor memory was assessed for 32 ε4/4 and ε3/4 age-gender matched AD patients through familiarity ratings of common odor stimuli given as part of a larger study. Homozygous ε4/4 individuals produced significantly lower odor familiarity ratings (p = .009), compared to the heterozygous group, while the two groups did not differ significantly in MMSE scores (p > .88). The current findings suggest that remote odor memory may be more impaired in AD ε4/4 homozygotes relative to other AD patients. This deficit may be indicative of unique neuropathology associated with ε4/4 individuals and suggests the usefulness and sensitivity of odor tasks in detecting those at risk for AD. Supported by NIH grant AG004085-25 to CM. We gratefully acknowledge the UCSD ADRC for subject recruitment (P50 AG005131-28) and the SDSU Lifespan Human Senses Laboratory for patient testing.
243 Poster #15 11 am-12:45 pm

Examining the Relationship Between Subjective Smell Loss Ratings and Olfactory Test Performance in Traumatic Brain Injury (TBI) Patients Pursuing Injury Litigation

Elissa McIntosh, Psychology (M)
Claire Murphy, Psychology

In this study, we investigated the relationship between smell loss ratings and olfactory test performance in 45 traumatic brain injury (TBI) patients. The objectives of the study were (1) to determine if the relationship between ratings and performance differed among olfactory tests, and (2) to determine if the relationship between ratings and performance was significantly altered in TBI patients involved in litigation. Each patient completed Olfactory Threshold and Odor Identification (ID) testing. Further, each patient rated their smell loss on a scale from 0 (no disability) to 100 (maximum disability). When examining all TBI patients, regardless of litigation status, regression analyses in each test showed a significant relationship between ratings and performance. As ratings increased (more disability), performance on both tests decreased. However, when accounting for litigation, we found differences between groups. For patients not involved in litigation, we found significant relationships between odor ID and ratings (p<.001), and between threshold and ratings (p=.01). Conversely, for patients involved in litigation, we did not find significant relationships between odor ID and ratings (p=.072), or between threshold and ratings (p=.224). From these results, we can conclude that there is a relationship between ratings and test performance when litigation status is not considered. However, this relationship is weaker (not significant) for TBI patients involved in litigation and these patients are not as accurate in rating their olfactory deficits. Though further study is warranted, this finding might point to a problem with malingering in this specific patient population, and suggests a need for more comprehensive olfactory testing when assessing TBI patients.

245 Poster #17 11 am-12:45 pm

I Wonder What’s in the Mystery Box: Cognitive and Social Behaviors in Individuals with Williams Syndrome

Philip Lai, Language & Communicative Disorders (D)
Judy Reilly, Psychology

Williams syndrome (WS) is a neurodevelopmental disorder with a deletion of approximately 25 genes at chromosome 7q11.23. The present study, Mystery Box, captures both cognitive and social behaviors as participants guess objects based on tactile sensation. The cognitive portion includes accuracy in naming the objects and complex. Behavioral coding captured the duration of contemplation before giving an initial response, while the social portion includes eye contact to the experimenter during the turn surrender phase. Facial expressions were also analyzed to capture non-verbal communication. Participants included typically developing adults (TD, n=14) and adults with Williams Syndrome (WS, n=17). The participants were given eight objects divided into categories: basic, intermediate, and complex. Behavioral coding captured the duration of contemplation before giving an initial response, percentage of participants who committed eye contact during the turn surrender phase, and whether facial expressions were utilized. Responses were compiled to compute the accuracy in naming the objects. Cognitive results revealed difficulties in the WS group, as they had trouble naming objects (<53%). On the other hand, the TD group only had difficulty naming complex objects, which resulted in a longer contemplation time. Interestingly, the WS
group did not exhibit this pattern as they remained consistent in all the categories. Results revealed more participants in the WS group committed eye contact to the experimenter during the turn surrender phase in all the categories. This pattern of eye contact in the WS group suggests the expression of their overly social phenotype, even when the experimenter did not return the eye contact. Differences in facial expression were found only for the complex objects, as the TD group produced more facial expressions. When examining valence, a significant difference was found during the answer phase; the TD group smiled while this pattern was not found in the WS group. Previous studies have shown that TD individuals smiled when faced with uncertainty. Although the WS group's performance was compromised in the cognitive domain, they displayed more eye contact, perhaps looking for social cues. This Mystery Box task serves to further characterize the cognitive and social profiles of WS, where behaviors were captured during periods of uncertainty.

**246 Poster #18 11 am-12:45 pm**

*OERP scalp topography as a function of age and Apolipoprotein E ε4 during encoding of olfactory information.*

Lisa Graves, Psychology (M)
Claire Murphy, Psychology

Alzheimer's disease is a neurodegenerative disorder characterized by severe cognitive deficits including memory loss. The disease currently affects 5.4 million Americans and costs the U.S. $200 billion each year in medical expenses. Along with increasing age, the Apolipoprotein E ε4 allele is a major risk factor for developing AD. The first sites of AD pathology occur in brain regions associated with memory and olfactory processing. Event-related potential (ERP) recording offers high temporal resolution and is a valuable noninvasive method for investigating olfactory function. In fact, electrophysiological evidence has indicated differences in OERP activity between healthy controls and individuals at risk for AD in tasks of odor recognition memory. Importantly, these differences in OERP activity are evident before the onset of typical cognitive and behavioral symptoms of dementia, signifying the potential contribution of OERPs as a tool for earlier AD diagnosis. Moreover, Alzheimer’s disease is unique from other dementias through its association with specific deficits in encoding new information. Previous OERP studies of recognition memory have focused on differences in OERP activity during retrieval. In the present study, 60 adults were equally divided into three age groups (younger, middle, older) matched on gender and ε4 status. OERPs were recorded while participants encoded odors that were presented with a computer-controlled olfactometer. In addition to univariate analyses of the effects of age and ε4 status on OERP latency and amplitude during encoding of odors, differences in OERP scalp topography were statistically analyzed using CARTOOL. Results indicated topographical differences as a function of age and ε4 status during encoding of olfactory information. These findings inform the effects of age and the ε4 allele on the neural correlates of odor recognition memory and the significant relationship between olfaction and neurodegenerative disease. This study is supported by NIH grants DC002064-14 and AG04085-25 to CM.

Session B-15
**Poster: Aerospace Structures**
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

**247 Poster #19 11 am-12:45 pm**

*Origami Inspired Design of Stiffened Shell Structures for Aerospace Applications*

Francisco Candido, Aerospace Engineering (U)
Satchi Venkataraman, Aerospace Engineering

This project aims to design stiffened shell structures using inspiration from the Japanese art of paper folding (Origami). In engineered structures, thin ribs (beams) are attached to the sheets to develop stiffened structures. The traditional methods used to fasten stiffeners to sheets (rivets, welding, or adhesively bonding) lead to structural failures due to stress concentrations. There is need to develop integrally stiffened structures that can eliminate fasteners or adhesive interfaces. Typically 90% or more of the material is machined in order to result in the stiffened geometry. This is expensive, energy inefficient and unsustainable. With traditional fabrication, stiffening designs are often limited to have uniform orthogonal (ortho-grid) or uniform triangular (iso-grid) patterns. Optimal design of structures results in placement of stiffening elements that match the load requirements. If the loading on the structure is non-uniform, then optimal structures will have non-uniform stiffening patterns.

This project examines the use of origami folding techniques to develop such spatially non-uniform stiffening rib patterns (skeletal structures). Origami-inspired folding provides a novel transformative approach to manufacturing spatially tailored stiffened shell structures. In this effort we develop a representation for skeletal (branched tree) stiffening patterns and explore algorithms and methods for folding such structures using origami principles. Our project is divided into 2 parts. The first is to obtain the optimal stiffening topology, which is a branched tree or skeletal structure, for a given load. This is obtained using structural optimization techniques, in which a finite element model of the stiffened plate structure is coupled with numerical optimization algorithms to optimize for stiffness. The minimization of the compliance (total strain energy) leads to a stiff structure. Once the optimal pattern is found, a geometric optimization is needed to find the shape of the sheet and the folding crease...
assignments that will transform the sheet to the required skeletal stiffening pattern. For this, we explore the circle packing design technique used by origamists to design skeletal structures that utilize the least amount of paper per flap.

248  Poster #20  11 am-12:45 pm
Experimental Investigation of Tapered Edge Closeouts in Sandwich Composite Panels
Scott James, Aerospace (U)
Satchi Venkataraman, Aerospace Engineering

The goal of this investigation is to develop experimental methods to investigate and quantify local deformation and failure mechanisms in tapered sandwich core closeouts using full-field deformation and strain characterization methods. Such methods are needed for development of analytical models, as well as for verification and validation of numerical models.

As weight and fuel savings have become increasingly important in aircraft structures, use of newer lightweight composite materials is being explored (i.e. composite sandwich panels). Use of composite sandwich construction for primary aircraft structures can lead to significant weight savings. The sandwich panel is constructed by affixing two thin rigid skins to a lightweight but thick core. The use of honeycomb cores to increase the plate thickness dramatically increases the stiffness and strength of a structure with minimal material weight increase. However, sandwich composite laminates exhibit poor damage tolerance and possess low transverse compression strength. As such, sandwich panels require modifications such as tapered closeouts for attachment to frames using mechanical fasteners.

With the introduction of this more complex tapered edge geometry, displacement and full field measurements are required to capture the localized behaviors (e.g. stress concentrations around sharp corners and edges, strain and displacement singularities in crack propagations). Geometry’s with a non-uniform cross-section along its length require accurate placement of conventional strain measurements and are often times unable to capture local deformations with any precision. Digital Image Correlation (DIC) techniques can be employed to accurately monitor the origin of localized phenomena in composites (i.e. sandwich composite panels). By using a stereo camera arrangement, images are captured at different time steps throughout the mechanical testing of the specimens and recorded for post-test analysis.

The aim of this investigation is to show that Digital Image Correlation can be used to verify and validate a numerical prediction model for a tapered edge closeout in a composite sandwich panel, for which, inherent by geometry, the strain field is heterogeneous. Moreover, DIC methods offer an opportunity to bridge the gap between the experiment and the numerical simulation allowing for the comparison between measured and computed displacements and strain fields.

249  Poster #21  11 am-12:45 pm
Experimental Investigation of Densified Honeycomb Cores at Tapered Sandwich Laminate Closeouts
Andrew Christensen, Aerospace (U)
Satchi Venkataraman, Aerospace Engineering

Laminated sandwich composites require local reinforcement at the location where they are connected or attached to other structures. The local strengthening prevents damage to the core caused by large compressive forces imposed by mechanical fasteners. Tapered closeouts in sandwich composites eliminate the need for local reinforcement of the honeycomb when joining multiple structures. In tapered closeouts the sandwich core thickness is reduced linearly to join the outer face sheets. This region without the core is used for mechanical fastening of the sandwich panel with rivets and bolts. However, the linear variation in core thickness of tapered closeouts reduces the stiffness of the sandwich structure. This region is usually the site of initiation and propagation of delamination failures, that limit the life of sandwich composites.

This research poster presents the results of an experimental investigation that compared the performance of designs with locally densified cores at the tapered closeouts. Under inplane and bending loads, high stress concentrations appear within the tapered region that make this section prone to failure by delamination of the face sheets from the core. The load at which the structure will fail is dependent on the bond strength between the face sheets and honeycomb core. The surface area of the material in contact with the adhesive layer determines the strength of the bond. By a process of edge rolling, it is possible to incrementally crush the honeycomb and achieve a densified crushed region of the honeycomb, that can be used at the tapered closeout. This section of the core will have altered material properties, along with increased interface strength. Experimental testing of sandwich closeouts under tensile loads showed that using densified honeycomb cores at closeouts increased the failure (facesheet-core delamination) load by 18%.

250  Poster #22  11 am-12:45 pm
Numerical Homogenization of Crushed Honey Comb Cores
Elizabeth Fortin, Mechanical Engineering (U)
Satchi Venkataraman, Aerospace Engineering

Sandwich composites are used to in modern aircraft structures to reduce their weight. They also create lightweight sheets used in Automobile, Airplane and Container Structures. Sandwich composites (e.g. corrugated cardboard) employ a low-density thick core sandwiched between two very thin but stiff materials. Cores are typically lightweight materials such as foams, honeycomb structures, or corrugations. Metallic honeycomb core structures are cellular materials with very thin walls shaped to
form honeycomb (hexagonal packing) structures. The sandwich composite when subjected to localized compression loads normal to its thickness direction crush the core and damage the sandwich composite. Various approaches to strengthening the cores at such load regions have been proposed, including using denser inserts or tapering the sandwich to remove the core material at the bolt region. Continuously graded and densified core materials can be obtained by inplane crushing of regular periodic honeycomb cores. The goal of this research is to develop a numerical analysis models and procedures to obtain effective material properties for such densified honeycomb core material. The process of defining effective properties for composite, cellular or porous materials is also referred as “homogenization.” Homogenization determines the overall properties of a heterogeneous material, thus allowing the two materials to be interchangeable. This poster presentation focuses on the use of homogenization to calculate the Elastic Moduli and Poisson’s ratio of an orthotropic heterogeneous material, namely the honeycomb core after its inplane crushing. The image of the cross-section of the crushed core was imaged and digitized to generate computer model of the geometry. The geometry model was imported into commercial analysis software (FEMAP), discretized, and meshed to develop a finite element analysis (FEA) model. The FEA model is used as a numerical test specimen and subjected to different loads and appropriate boundary conditions. Effective homogenized properties are obtained by equating the displacements on the boundary of the heterogeneous model to the displacements on the boundary of a model with equivalent homogenous property one can derive. The uses of homogenization techniques are critical to the analysis and design of structures that use cellular core materials.

251 Poster #23 11 am-12:45 pm
Experimental Validation of Inplane Crushing of Honeycomb Cores for Producing Functionally Graded Core Materials
Brett Sens, Aerospace Engineering (U)
Satish Venkataraman, Aerospace Engineering
Laminated sandwich composites possess very high specific bending stiffness and high specific inplane strengths. Sandwich constructions are used in new airplanes to make them stronger and lighter. The high bending stiffness of sandwich composites is due to the thick core that separates the two thin and stiff face sheets. To reduce the weight the thick core is made of light density porous materials such as honeycomb core structures. To avoid local crushing and damaging of honeycomb cores when fastening multiple beams together, tapered closeouts are used. By creating a taper region the sandwich panel can be attached to other structures with mechanical fasteners. The tapered close out region becomes a location of high shear stress and delamination failures. The shear strength and interface delamination strength can be increased by using denser honeycomb cores. Using denser cores over the entire structure to accommodate the locally high stresses leads to inefficient use of material and non-optimal heavier designs. It is desirable to create materials that have locally increased density and strength at regions where they experience high stresses. Materials that have such gradation in properties to match its stress requirement is called “functionally graded material.”

This research project investigated methods to create graded and densified cores for sandwich composites using honeycomb core materials. A novel technique of producing graded core materials from honeycomb cores through an inplane rolling operation. A new device designed for inplane crushing is presented. Desired grading in properties are obtained by using multiple rolling steps in which the roller diameter and crush depth are varied for each step. The experimental results are used to validate finite element simulations of core crushing previously performed.

Session B-16
Poster: Energy
Friday, March 8, 2013, 11:00 am – 12:45 pm
Location: Library Dome

252 Poster #24 11 am-12:45 pm
Analysis of campus buildings from an energy conservation standpoint
Paulo Souza, Mechanical Engineering (U)
Thais Alves, Civil, Construction, and Environmental Engineering
Solving the problem of waste and misuse of electric power is currently one of the main challenges faced by engineers and technicians in different fields. We are living in a time in which environmental concerns have become ever more important and there is a higher demand each year for practical solutions to reduce waste in residential and commercial buildings. San Diego State University is a large campus with buildings that would benefit from small improvements related to energy use and conservation. Some of the campus buildings date back to 1930 when the technology and solutions of the time did not properly address energy conservation in buildings. The research team has visited buildings on campus (Arts & Letters, Physics, Engineering) to search for points where we could make better use of natural resources and conserve energy. The research team has documented building features by taking pictures and notes of specific areas that help or hinder energy conservation. One limitation of this research is that financial analyses have not been performed to address current and future solutions to the building features investigated. The project started during the Fall 2012 semester and is ongoing until the Summer of 2013. This project is divided in two main parts: an analysis of systems internal to the buildings, and the external and architectural features that impact
energy conservation. This abstract is related to the latter and it will focus on factors such as light distribution in classrooms, location of trees and windows, and orientation of the buildings. A companion abstract related to this research addresses systems that are found inside the building (e.g., lighting, audio/visual, HVAC).

253 Poster #25 11 am-12:45 pm
Internal building systems and their impact on energy conservation
Aaron Nickovich, Mechanical Engineering (U)
Thais Alves, Civil, Construction, and Environmental Engineering

The price of energy is increasing while, simultaneously, energy demands continue to rise. The consequence of this is that engineers are currently faced with the difficult challenge of making energy conservative designs. Energy conservation in buildings is an important topic to be investigated as buildings consume massive amounts of energy thus presenting great potential for energy savings. This research project is currently concerned with identifying inefficiencies in the design and operation of the electrical and mechanical systems of buildings on campus and potentially identifying low or no cost solutions that could improve efficiency in existing buildings as well as the design of future buildings. The electrical systems such as audio and visual equipment, lights, fixtures, sensors, and switches are explored. Likewise, mechanical systems such as HVAC and water fountains are explored as well. This is an ongoing study in its early stages, but the research team has found by simple observations, which were captured by use of digital cameras, that both new and old buildings on campus can be improved. In addition to this research abstract which proposes research on the interior features of buildings, a companion abstract complements the findings presented here and deals with the shell of buildings, or the exterior, that incorporate building features such as its location, orientation, and interaction with the surrounding environment.

254 Poster #26 11 am-12:45 pm
Biogas Production of Anaerobic Digesters
Carol Stein, Civil Engineering (U)
Tyler Radniecki, Civil, Construction, and Environmental Engineering

This project aimed to optimize the construction and operation of small scale single-stage and two-stage anaerobic digesters to be used for biogas production. Biogas is a mixture of gases consisting primarily of methane and carbon dioxide. In order to optimize biogas production within the anaerobic digesters, each of the individual components of the digesters were tested in various quantities and ratios. The individual anaerobic digesters components are comprised of a liquid phase (either deionized water or primary effluent from a local wastewater treatment plant); thickened waste activated sludge (TWAS); inoculum (an anaerobic slurry of bacteria containing methanogens); and, in later experiments, fats, oils, or greases (FOG). The first optimization experiments consisted of testing various ratios of TWAS to inoculum and various ratios of the TWAS/inoculum mixture to the deionized water volume. These studies indicated that the optimal ratio of TWAS to inoculum is 3:1 and that the optimum ratio of the TWAS/inoculum mixture to deionized water was also 3:1. Utilizing these 3:1 ratios, an average of 20mL of biogas was generated from each anaerobic digester over 15 days (the minimum length of time that TWAS must be digested to ensure pathogen inactivation). The second set of optimization experiments used the previously optimized TWAS/inoculum/DI water ratios of 3:1 as the base composition of the anaerobic digesters before the addition of varying amounts of FOGs (in these experiments, soybean oil was used). TWAS to FOG ratios of 1:1, 2:1, 3:1, and 1:3 were compared. However, for all ratios tested, the production of biogas ceased after 3 days due to a significant drop in pH, thus an optimal combination could not be deduced. By replacing the DI water with primary effluent (which has a higher buffering capacity), biogas production increased an average of 60 mL to 100mL (a 250% increase) over 15 days. However, biogas production still ceased after 3-5 days due to a drop in pH. Future experiments will utilize two stage anaerobic digesters which will include the addition of a strong base to prevent the observed drops in pH which caused biogas production to cease.

255 Poster #27 11 am-12:45 pm
Carbon Particle Generation and Small Particle Heat Exchange Receiver Lab Scale Testing
Lee Frederickson, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

High temperature central receivers are on the forefront of current concentrating solar power research. Current receivers use liquid cooling and power steam cycles, but new receivers are being designed to power gas turbine engines within an energy cycle while operating at a high efficiency. To address this, a lab-scale Small Particle Heat Exchange Receiver (SPHER), a high temperature solar receiver, was built and is currently undergoing testing at the San Diego State University’s (SDSU) Combustion and Solar Energy Laboratory. The final goal is to design a full-scale SPHER that can power a 5MWe turbine and be used within a Brayton cycle.

The SPHER utilizes carbon particles generated in the Carbon Particle Generator (CPG) at SDSU as an absorption medium for the solar flux. Natural gas and nitrogen are sent to the CPG where methane undergoes pyrolysis to carbon particles and nitrogen is used as the carrier gas. The resulting particle-gas mixture flows out of the vessel and is met with dilution air, which flows to the SPHER. The lab-scale SPHER is an insulated steel vessel with an ellipsoidal shaped quartz window. For on-sun testing, a solar flux is produced by a solar simulator, which consists of a 15kWe xenon arc lamp, situated vertically, and an ellipsoidal reflector to obtain a point focus at the receiver window. The solar simulator
has been shown to produce an output of about 2.67kW within a 10cm diameter. Inside of the SPHER, the carbon particles in the inlet particle-gas mixture absorb radiation from the solar flux. The carbon particles heat the air and eventually oxidize to carbon dioxide, resulting in a clear outlet fluid stream.

The lab scale system has been tested and is undergoing experimentation at various gas flow rates. A new extinction tube was designed and built to obtain more accurate mass loading data. Piping and insulation for the CPG and SPHER were improved based on observations between testing periods. These improvements have been made in order to achieve the lab scale SPHER design objective gas outlet flow of 650°C at 5 bar.

256 Poster #28 11 am-12:45 pm

**Power Optimization and Control in Wind Energy Conversion Systems using Extremum Seeking**

Azad Ghaffari, JDP (D)  
Sridhar Seshagiri, Electrical and Computer Engineering

Power optimization and control for grid-coupled wind energy conversion systems (WECS) has been extensively studied for variable speed wind turbines (WTs). However, existing methods are model-based, and are highly dependent on the system dynamics. We employ extremum seeking (ES), which is a non-model-based optimization approach, to perform maximum power point tracking (MPPT), i.e., extract maximum power from WECS in their sub-rated power region. Since the convergence rate of the ES design may be limited by the speed of the system dynamics, we also design a nonlinear controller, based on the field-oriented control (FOC) concept and feedback linearization, that yields improvement in convergence rate by two orders of magnitude. The outer ES loop tunes the wind turbine speed to maximize power capture for all wind speeds within the sub-rated power operating conditions. The inner-loop nonlinear control maintains fast transient response through a matrix converter, by regulating the electrical frequency and voltage amplitude of the stator of the (squirrel-cage) induction generator (IG). Simulation results are presented to show the effectiveness of the proposed design.

257 Poster #29 11 am-12:45 pm

**The Morphing Turbine Blade for Wind Energy Conversion**

David MacPhee, Mechanical Engineering (D)  
Asfaw Beyene, Mechanical Engineering

Wind turbines are designed to optimally operate at a given load (wind speed). However, changing weather conditions impose variable loads, where performance can suffer drastically. It is then imperative to select a conversion system for passable efficiency over a wide range of wind conditions characteristic to the selected site. Recent advances in adaptive motion and biomimicry give rise to a new turbine concept, the morphing turbine blade, which employs continuous shape morphing and allows the airfoil to adapt effectively to variable aerodynamic conditions. This concept, inspired by biomimetics, especially fish locomotion, can offer better performance than fixed geometry airfoils, especially with heavily variable local wind conditions.

Session B-17

**Poster:**

**Materials, Reactions, and Supersonic Flow Modeling**

Friday, March 8, 2013, 11:00 am – 12:45 pm

Location: Library Dome

258 Poster #30 11 am-12:45 pm

**Reactive Spin Casting of NiTi**

Derek Sacco, MSME (M)  
Khaled Morsi, Mechanical Engineering

The present work is part of the NSF Engineering Research Center for Sensorimotor Neural Engineering. Microscale pressure sensors can be integral to home-based rehabilitation. Specifically, micro-featured thin foil with “super” elastically deformable bumps may provide this ability. This project’s objective is to design and build an experimental device to initially produce a superelastic thin NiTi foil using the novel process of reactive spin casting. Reactive spin casting of NiTi involves reacting/melting mixed nickel and titanium powder compacts through the thermal explosion mode of combustion synthesis and spreading it out on a featured disk that is spinning. This new process would provide a cheap alternative to the fabrication of the highly sought after NiTi superelastic and shape memory alloy. The end final product must be: superelastic (requiring complete reaction), thin (less than 500 microns), continuous (no holes in foil) and micro-featured. Many variables in the process have been considered: disk material, heating method, experimental atmosphere (vacuum or argon), angular disk speed, preheating the disk, heating rate of compact and powder particle size. Currently, thin layers of NiTi have been formed. Work on refining the product is continuing.

259 Poster #31 11 am-12:45 pm

**Kinetics of Interparticle Contact Growth during Consolidation of Vanadium Carbide Powders**

Diletta Giuntini, Mechanical Engineering (D)  
Eugene Olevsky, Mechanical Engineering

Experimental procedures with vanadium carbide powders were conducted with conventional dilatometry and Free Pressure-Less Spark Plasma Sintering (FPSPS) techniques. The neck growth was studied by means of SEM analysis; the data obtained were imbedded in the equation for surface diffusion. The set of equations derived was solved with an iterative computational procedure, leading to the calculation of the value of vanadium carbide activation energy.
260  Poster #32  11 am-12:45 pm

Experimentation and Constitutive Modeling for Spark Plasma Sintering of Copper

Wei Li, Mechanical and Aerospace Engineering (D)
Randall German, Mechanical Engineering

Spark Sintering (SS) is similar to hot pressing, but heating is by electric current passing through the die and powder compact with rapid heating and uniaxial compression features. The technological merits of spark sintering come from rapid heating, short holding times, and possible electric field induced diffusion. Recently, extensive efforts have been made towards the development of instruments for rapid densification of materials at a relatively low temperature. Although SS has been employed for fabrication of various materials, there exists a significant gap in the understanding of the fundamental densification mechanisms, and establishing effective modeling -simulation framework for prediction purpose. In the present research, copper powder as a representative of electrically conductive materials for Spark Sintering is studied. The material parameters and constants are determined from experiments and then used for building the constitutive model to simulate the spark.

261  Poster #33  11 am-12:45 pm

Processing of Zirconium Carbide Annular Shape Pellets by Spark Plasma Sintering

Xialu Wei, Mechanical Engineering (D)
Eugene Olevsky, Mechanical Engineering

In this study, the Spark Plasma Sintering (SPS) consolidation of Zirconium Carbide (ZrC) powder pellet with annular shape was first performed under different processing conditions. Based on the experimental results obtained for chosen benchmark SPS conditions, a set of optimal constitutive parameters was selected to build an SPS finite element model to numerically analyze the processing of the annular ZrC pellet by SPS. Both tooling and specimen properties were calibrated in order to fit the benchmark experimental results and to further independently predict the material densification behavior during SPS. The developed 3-D finite-element code attempts a fully-coupled, parallel thermo-electro-mechanical analysis of the material processing under SPS conditions.

262  Poster #34  11 am-12:45 pm

Chemical kinetic study of extinction and autoignition of toluene flames

Vaishali Amin, Engineering Sciences (D)
Gustaaf Jacobs, Aerospace Engineering & Engineering Mechanics

Kinetic modeling and experimental studies are performed to elucidate the structure and mechanisms of extinction and autoignition of toluene flames in a counterflow configuration under nonpremixed conditions. Computations are performed using detailed chemistry to determine the flame structure and to obtain values for critical conditions of extinction and autoignition. Three different mechanisms are applied and the results compared with experimental data to select the appropriate mechanism for further study. Sensitivity analysis of rate constant, reaction pathway analysis and spatial reaction rate profiles are used for that mechanism to identify the reactions that control the critical conditions of autoignition and extinction.

Experiments are conducted in a flame stabilized between two opposing streams. The fuel stream is a mixture of vaporized toluene and nitrogen, and the oxidizer stream is air. Concentration profiles of stable species are measured by removing samples from the reacting mixing layer using a quartz microprobe. The samples are analyzed using a gas chromatograph. Measured profiles include those of C7H8, O2, N2, CO2, CO, H2O, and H2. Temperature profiles are measured using a Pt-Pt13%Rh thermocouple. Critical conditions of extinction are measured. Data giving the fuel mole fraction at extinction as a function of the strain rate are obtained. Also, oxidizer temperature at ignition is measured for fixed fuel mole fraction and different strain rates. The data collected in these experiments is compared with the computations to perform the above analysis.
264 Poster #36 11 am-12:45 pm
Borate Binding to the Periplasmic Iron Transport Protein FbpA in a Marine Bacterium
Jerrell Tisnado, Biochemistry (U)
Carl Carrano, Chemistry

This project proposes to examine the effects that boron, an essential but largely ignored element, has on the iron transport processes of algal-associated marine bacteria. Our initial preliminary results (data not shown) indicate that in Marinobacter algicola, boron clearly affects the expression levels of a number of proteins. We were surprised to find that one of the most highly (down) regulated proteins turned out to be the periplasmic iron transport protein, FbpA. The FbpA gene expression is also down regulated by the presence of boron. Thus it appears that boron could affect iron metabolism in marine bacteria such as Marinobacter algicola. Our hypothesis is that boron affects FbpA by a direct interaction with the protein leading indirectly to changes in protein and gene expression. We are currently preparing recombinant FbpA from Marinobacter and propose to characterize the binding of borate to the Marinobacter protein, determine its ability to function as a “synergistic” anion in the iron holoprotein, and measure its effects on iron loading thermodynamics and kinetics. This will be done using a variety of physical techniques including isothermal titration calorimetry (ITC) and 11B NMR.

This project is currently taking place in the lab of Dr. Carl Carrano, with partial funding by the NIH through the Minority Biomedical Research Support program, grant number 5R25GM058906-12.

265 Poster #37 11 am-12:45 pm
Micromide: A Cytotoxic Alkaloid Undergoing Shifts in Stereochemistry and Primary Structure
Natalia Kettooila, Biochemistry (U)
Robert Metzger, Chemistry

Micromide is a cytotoxic alkaloid isolated from a species of marine cyanobacterium of the genus Symploca collected in Guam (1). It has shown to be effective against multi-drug-resistant solid tumors. Micromide was isolated and identified by PG Williams, WY Yoshida, RE Moore, and VJ Paul (1) at the University of Hawaii in Manoa, Honolulu. However, it is evident that something may have gone awry because a different NMR spectrum for micromide, synthesized by Dr. Mikael Bergdahl using the structure proposed by Williams et al., differed from the original (1,2). Moreover, using the same assay as Williams et al., Dr. Paul Van der Geer could find no anti-tumor activity using the synthetic micromide (3). We have attempted to use methods of computational chemistry, specifically to predict NMR spectrum with different isomers, to determine if there is a mistake in the structure proposed by Williams et al (1). The NMR spectrum of the original molecule was obtained using several computer programs including: ChemOffice suite (4) of software (Cambridgetsoft, Inc.), the Discovery Studio suite (5) of software (Accelrys, Inc.), and Gaussian 9 (Gaussian, Inc), (6). The obtained results confirmed there is a difference in the spectrum compared to that reported by Williams et al. Once the theoretical NMR spectrum showed a difference from the original spectrum, we decided changing either the stereochemistry or primary structure of micromide could be useful in determining where mistakes may have been made. In the original structure containing several chiral centers, changing one or a few of them changes the conformation and causes a shift in the NMR spectrum. Changing the stereochemistry of L-Val and N-Me-D-Val in the structure indicated a shift in the NMR spectrum, validating a difference from the original NMR spectrum proposed by Williams et al.

266 Poster #38 11 am-12:45 pm
Computational Docking Studies of Tetrahydroneopterin and Pteridines to Phenylalanine Hydroxylase
Victoria Nguyen, Chemistry, emphasis in Biochemistry (U) 
Robert Metzger, Chemistry

Previously studied computational docking of pteridines was done for dihydrofolate reductase and dihydrobipterin reductase, enzymes responsible for the regeneration of tetrahydrobipterin (THB) cofactor for other metabolic enzymes for the human health. THB is a coenzyme for phenylalanine hydroxylases, pterin-dependent amino acid hydroxylases, dihydrofolate reductase, nitric oxide reductase, and other metabolic enzymes. Patients with inflammation have certain macrophages that produce 7,8-dihydroneopterin (DHN) rather than THB. DHN further gets reduced to neopterin non-enzymatically and high levels of neopterin in patients predicts bad prognosis such as phenylketonuria. Now a binding study of pterines is done specifically in the metabolic enzyme, phenylalanine hydroxylase. Since neopterin inflammation levels are more than normal, could neopterin fit in the active site of phenylalanine hydroxylase and the other enzymes to possibly inhibit enzymatic activity? In addition, why does nature invest so much energy in correct chirality if chirality doesn’t count? This study is done to understand neopterin’s role in phenylalanine hydroxylase through computational chemistry in order to develop models that can lead to effective treatment. Molecular models of the pteridines in lowest energy, optimized conformations were made using the programs, ChemOffice suite of software (Cambridgesoft, Inc.) and Gaussian 9 (Gaussian, Inc.) for in silico docking with x-ray
crystallography of phenylalanine hydroxylase from Protein Data Bank website (pdb.org) using GOLD (CCDC) and the Discovery Studio suite of software (Accelrys, Inc.). So far, results show that all pteridine derivatives bound in phenylalanine hydroxylase with neopterin and DHN having the highest successful binding rate. We report conformational docking of neopterin inside phenylalanine using x-ray crystal structure of phenylalanine hydroxylase.

**267 Poster #39 11 am-12:45 pm**

*Synthesis and study of novel protic carbene catalysts for transforming glycerine into other chemicals*

Khai Le, Chemistry (U)
Douglas Grotjahn, Chemistry

Introduction: The goal is to create a catalyst that can remove the secondary alcohol from glycerol, forming more valuable by-products from biodiesel production which could then be utilized in the synthesis of other compounds. It is very difficult to get selective deoxygenation of glycerol and a robust, stable catalyst will be needed. The Grotjahn lab has experience making a rare form of ligand, a protic carbene, which may be expected to lead to selective chemistry. Methods: For the catalyst, the target ligand is 6-(4-t-butyl-1H-imidazol-1-yl)-2,2-bipyridine (1) and its analog without the t-butyl group (2) which would be metallated with different metals to test reactivity. The ligand synthesis started from 2,2'-bipyridine, imidazole, and t-butylimidazole. During the synthesis process, it proved to be a struggle to synthesize 6-chloro-2,2'-dipyridine: three different methods were attempted in preparing 2,2'-dipyridine-1-chloride, and one of them worked better giving a 50% yield overall. The synthesis of 6-chloro-2,2'-dipyridine started by oxidizing 2,2'-bipyridine to make 2,2'-dipyridine-N-oxide which was reacted to make [2,2'-bipyridine]-6H1-one. Reacting the pyridine with phosphorus oxychloride made 6-chloro-2,2'-bipyridine which was coupled with imidazole to make ligand 2. However, the metatlation attempts between 2 and palladium(II) chloride, have been unsuccessful despite attempts under a number of different reaction conditions. The first ligand (1) is also novel and was made by coupling 6-chloro-2,2'-bipyridine and t-butylimidazole, yielding 23% of (1) in one unoptimized experiment. Metatlation was attempted with (1) and platinum(II) chloride in d6-DMSO but was unsuccessful. However, the data for metatlation of (1) in CH3COOH/CD3COOD at 140°C indicates product formation. In contrast, the second, less hindered ligand (2) was metalated with palladium(II) chloride in DMSO, and in acetic acid with difference temperature for both, but in neither case did it work. Conclusions: Though still preliminary at this stage, we see easier metalation with the more hindered ligand. The results of these metalation experiments and others will be presented, along with discussion of the factors influencing yield of ligand synthesis and metatlation steps, and characterization data of the products. Support of K.L. as a Presidents’ Commission Scholar is gratefully acknowledged.

**268 Poster #40 11 am-12:45 pm**

*Using cyclic voltammetry to study the biological reactivity of 1-methyl-5-nitroimidazole with various acids in DMSO*

Eglema Roshnaye, Chemistry (U)
Diane Smith, Chemistry

Metronidazole, a well-known anti-protozoal and anti bacterial drug, is currently being used as a treatment for *Giardia lamblia*, which is a common anaerobic intestinal parasite. However, recent research has suggested that *Giardia lamblia* has developed resistance to the current drug in market, and the search for an alternative drug has begun. To better understand the biological reactivity of Metronidazole, we are using electrochemistry to study one of its derivatives, 1-methyl-5-nitroimidazole. The reactivity of this compound will be investigated in DMSO in the presence of several acids: perchloric acid, 4- cyanophenol, 2-naphthol, and N- (tert-butoxycarbonyl) -L cysteine methyl ester.

**269 Poster #41 11 am-12:45 pm**

*Voltammetry of 2-nitroimidazole*

Samvel Avagyan, Biology (U)
Diane Smith, Chemistry

This project focuses on the voltammetry of 2-nitroimidazole derivatives, which are highly active biological compounds that can be used for therapeutic purposes. One 2-nitroimidazole derivative, benzimidazole, is currently one of only two drugs used for treating Chagas Disease, an infection caused by *Trypanosoma cruzi* (1). It is believed that the reducing environment inside the protozoan forms the highly reactive hydroxylamine and nitroso forms which cause DNA damage (2). 1-methyl-2-nitroimidazole has also been studied as a radiosensitizer in cancer treatment; however it was discontinued due to complications that arose during the clinical trial phase of the drug (3). More recently, the imidazole has been studied for imaging purposes with certain kinds of cancers (4). Our aim is to gain a qualitative understanding of the specific redox pathways of the hydroxylamine, nitroso, and other intermediates that form during the reduction/oxidation of the compound. Cyclic voltammetry experiments with 1-methyl-2-nitroimidazole are being carried out in the presence of a variety of acids: perchloric acid, 2-naphthol, cysteine, and 4-cyanophenol. The results will be compared to the more studied systems of nitrobenzene, metronidizole, 5-nitroimidazole and 4-nitroimidazole to see the similarities and differences between the compounds. The data gathered thus far suggests the 2-nitroimidazole reacts with acids under reducing conditions in a similar fashion as nitrobenzene. However, there are significant differences when compared to metronidizole and 4-nitroimidazole.
**Signaling protein Sts-1 contains a novel phospho-tyrosine binding domain and down-regulates NGF receptor-mediated tyrosine phosphorylation**

Spencer Swarts, Chemistry and Biochemistry (D)  
Peter van der Geer, Chemistry and Biochemistry

Multicellular organisms rely on intercellular communication to develop, survive, and carry out other complex biological functions. Communication between cells is mediated by extracellular messengers that are usually detected by cell-surface receptors. Receptor tyrosine kinases (RTKs), which catalyze the addition of phosphate groups to tyrosine residues, represent an important class of receptors. Because many human illnesses result from defects in RTK signaling, it is important to characterize the signal transduction pathways used by these receptors.

It has been firmly established that tyrosine phosphorylation sites can act as binding sites for specific proteins. Consequently, synthetic peptides designed based on phosphorylation sites can be used to purify phospho-tyrosine binding proteins. In our experiments, whole cell lysates were incubated with the peptides (which themselves were bound to agarose to facilitate isolation). Proteins that bound to the peptide were denatured and separated by SDS-PAGE and identified using mass spectrometry.

Using this approach, we recently identified Suppressor of T-cell receptor Signaling-1 (Sts-1), a protein containing an Ubiquitin-association domain, an esterase domain, a Src-homology domain, and a phospho-glycerate mutase domain. To identify the binding domain we have designed mutant proteins that have been tested for their ability to bind to phosphotyrosine-containing peptides. In addition, we have used Sts-1 over-expression and knockdown experiments to evaluate its function in signal transduction. Preliminary results suggest that Sts-1 dephosphorylates specific signaling proteins, including the NGF receptor.

**Exploration and suppression of tau-induced cardiac and skeletal muscle defects in a Drosophila model**

Adriana Trujillo, Biology (M)  
Girish Melkani, Biology

Hyperphosphorylation and aggregation of the microtubule-associated protein tau into tangles occurs in several neurodegenerative diseases referred to as tauopathies. Tau mutations, including tau$^{R406W}$ and tau$^{V337M}$, have been associated with tau hyperphosphorylation and neurodegeneration. Accumulation of phosphorylated tau in cardiac and skeletal muscle biopsy samples suggests that striated muscle tissue generates tau-amyloid which causes the destruction/malfunctioning of myocytes. However, it is unknown how mutations in the tau gene lead to myopathies and moreover, there is no experimental model to understand tau-mediated striated muscle dysfunction. To test the effects of tau mutations on cardiac structure and function, we developed a novel Drosophila model that expresses pathological human tau in the heart using the UAS-Gal4 expression system with a cardiac specific driver. Cardiac physiology was assessed using high-speed video recording of heart tube contractile parameters from semi-intact heart preparations. Compared to control human tau (h-tau), expression of mutant tau (h-tau$^{R406W}$ and h-tau$^{V337M}$) resulted in progressive cardiac dysfunction and ultrastructural abnormalities. Expression of h-tauR406W in 4 week-old hearts resulted in severe cardiac dilation, reduced contractility, increased arrhythmia, and ultrastructural defects. Interestingly, cardiac dilation and ultrastructural defects in 4 week-old h-tau$^{R406W}$ flies were suppressed by cardiac overexpression of DRP-1 (a regulator of mitochondrial biogenesis), or TRAP-1 (a mitochondrial chaperone). Additionally, expression of mutant tau (h-tau$^{R406W}$ and h-tau$^{V337M}$) in indirect flight muscles using Act88F driver resulted in reduced flight ability and ultrastructural defects, including myofibrillar degeneration and mitochondrial elongation. Expression of h-tau$^{V337M}$ in 4 week-old hearts resulted in reduced contractility, increased arrhythmia, and fragmented mitochondria. Interestingly, cardiac dilation and ultrastructural defects in 4 week-old h-tau$^{R406W}$ flies were suppressed by cardiac overexpression of DRP-1 (a regulator of mitochondrial biogenesis), or TRAP-1 (a mitochondrial chaperone). Additionally, expression of mutant tau (h-tau$^{R406W}$ and h-tau$^{V337M}$) in indirect flight muscles using Act88F driver resulted in reduced flight ability and ultrastructural defects, including myofibrillar disorganization, bulk Z-disk accumulation, and mitochondrial abnormalities. Our data demonstrate pathological consequences for tau mutations in striated muscle and a link between tau-induced myopathies and mitochondrial defects.
Ubiquitination of target proteins by ubiquitin ligases is a vital regulatory mechanism controlling a broad range of cellular functions. In spite of their importance in cell physiology, our knowledge of the specific targets remains limited. Furthermore, ubiquitin-mediated signaling is linked to diseases such as cancer or neurodegenerative disorders. We are studying the role of the ubiquitin system during regeneration in planarian flatworms. These organisms are known for their capacity to regenerate lost body parts after amputation; this ability relies upon a population of pluripotent stem cells planarians maintain throughout their lives. Thus, planarians are an excellent model to examine the role of the ubiquitin system during stem cell regulation in vivo. In this study, we are investigating the roles of HECT-domain ubiquitin ligases. We have identified and cloned 19 HECT E3s from the planarian Schmidtea mediterranea and have examined their pattern of expression in the animal by whole-mount in situ hybridization. These genes are expressed in the stem cells and differentiated tissues. We are characterizing the functional roles of HECT E3s in the animal by RNA interference. Our screen has revealed an interesting role for a planarian homolog of trip12 in posterior patterning. When we knock down trip12 and amputate the heads, the trunk fragments regenerate normally; however, head fragments make small or indented tails or do not form a tail altogether. Furthermore, we have found that trip12 also functions similarly in tissue maintenance. Intact animals treated with trip12 dsRNA show reduced stem cells and their progeny posteriorly, an overall decrease in mitotic activity, and severe tail regression, but the animals remain viable. This suggests that trip12 has a role in defining tail identity or posterior fate. In mammals, trip12 is known to target ARF, an important activator of the tumor suppressor p53, and is essential for embryonic development. Our experiments reveal a novel role for trip12 in tissue regeneration. Future experiments will aim to identify trip12 targets in planarians. Further characterization of other planarian HECT-domain E3 ubiquitin ligases will also help us to gain insights into the potential function of these enzymes in adult tissue homeostasis and regeneration.

Myosin, the molecular motor, interacts with actin filaments in the presence of ATP to produce muscle contraction. Mutations in the human embryonic myosin heavy chain cause Freeman Sheldon Syndrome (FSS), which is characterized by multiple congenital muscle contractures affecting facial and limb skeletal muscles. Structural analysis of myosin heavy chain reveals that most of the FSS mutations lie near the groove between the ATP binding site and actin binding site. These mutations are predicted to create structural changes in the ATP binding site, disrupting the binding of nucleotide to myosin. We hypothesize that FSS myosin along with ADP remains constantly bound to actin, leading to permanent contractures. Our overall aim is to identify the biochemical, structural and functional defects caused by FSS myosin mutations, using Drosophila melanogaster as the model organism. In vitro mutagenesis was performed to produce two myosin transgenes with the Y583S and R672C mutations. Lines containing transgenes were crossed into the indirect flight and jump muscle endogenous myosin null background to obviate the masking effect of wild-type myosin. Lines with near to wild-type expression of myosin were chosen to perform further studies. The homozygous and heterozygous transgenic flies showed a drastic reduction in their flight and jump ability when compared to controls indicating that sarcomere structure is compromised. Immunofluorescence confocal microscopy of the young homozygotes showed disorganization of myofilibrils. Electron microscopy of the indirect flight muscles of young homozygotes showed thickening of Z-discs and diverging myofilibrils, which indicates sarcomere disruption. ATPase and in vitro motility assays will help in understanding the effect of the mutations on the rate of ATP hydrolysis during the chemomechanical cycle and the ability of mutant myosin to translocate actin in the presence of ATP respectively. Overall, this model will yield insights into the mechanistic basis of FSS and may allow us to identify therapeutics to ameliorate FSS symptoms.

Structural analysis of myosin heavy chain reveals that most of the FSS mutations lie near the groove between the ATP binding site and actin binding site. These mutations are predicted to create structural changes in the ATP binding site, disrupting the binding of nucleotide to myosin. We hypothesize that FSS myosin along with ADP remains constantly bound to actin, leading to permanent contractures. Our overall aim is to identify the biochemical, structural and functional defects caused by FSS myosin mutations, using Drosophila melanogaster as the model organism. In vitro mutagenesis was performed to produce two myosin transgenes with the Y583S and R672C mutations. Lines containing transgenes were crossed into the indirect flight and jump muscle endogenous myosin null background to obviate the masking effect of wild-type myosin. Lines with near to wild-type expression of myosin were chosen to perform further studies. The homozygous and heterozygous transgenic flies showed a drastic reduction in their flight and jump ability when compared to controls indicating that sarcomere structure is compromised. Immunofluorescence confocal microscopy of the young homozygotes showed disorganization of myofilibrils. Electron microscopy of the indirect flight muscles of young homozygotes showed thickening of Z-discs and diverging myofilibrils, which indicates sarcomere disruption. ATPase and in vitro motility assays will help in understanding the effect of the mutations on the rate of ATP hydrolysis during the chemomechanical cycle and the ability of mutant myosin to translocate actin in the presence of ATP respectively. Overall, this model will yield insights into the mechanistic basis of FSS and may allow us to identify therapeutics to ameliorate FSS symptoms.

Structural Studies of STS-1
Eric Durrant, Cell and Molecular Biology (M)
Peter van der Geer, Chemistry and Biochemistry
Within living organisms, cells must communicate with each other in order to function properly. Extracellular signals are received by cells that then trigger signaling cascades within the cell, this is often referred to as signal transduction. Here we report on our studies of Suppressor of T-cell receptor Signaling-1 (STS-1)
and it's involvement in signaling events downstream of receptor tyrosine kinases (RTKs). Sts-1 was first identified by affinity purification using Jak2 phosphotyrosine peptide. It was later discovered, STS-1 is a phosphatase for Zap-70 and Syk, which are involved in initial stages of T-cell and B-cell receptor signaling, respectively. There are four domains within STS-1; the amino terminus contains a ubiquitin-associated (UBA) domain, a 2 histidine phosphoesterase (2HPE) domain, and a Src homology 3 (SH3) domain while a phosphoglycerate mutase homology (PGM) domain resides in the carboxyl terminus. The PGM domain has been studied extensively, it is responsible for the phosphatase activity and the crystal structure has been solved. What we are focusing on is how does STS-1 recognize the phosphotyrosine residues in order to dephosphorylate them? Based on the Simple Modular Architecture Research Tool (SMART), there are no phosphotyrosine binding domains (SH2, PTB, C2, or HYB) in STS-1. We hypothesize that there must be a novel phosphotyrosine binding domain within STS-1. Recombinant STS-1 constructs are being made and phosphotyrosine binding assays are being performed to determine what region of the protein is responsible for recognizing this modification. With this construct, we plan on using X-ray crystallography to find out which residues in this domain are associating with the peptide substrate by comparing unbound and bound crystal structures. Key words: signal transduction, phosphotyrosine, crystallography

275 Poster #47 11 am-12:45 pm
Recreating the Cardiac Stem Cell Niche to Improve Regeneration
Megan Monsanto, Biology (M)
Mark Sussman, Biology

Stem cell therapy is a promising strategy to treat ischemic heart disease. Numerous trials demonstrate the efficacy of cellular transplantation, however few long-term benefits have been shown. Poor cardiac cell retention is a major reason why studies have failed to show clinically relevant increases in viable myocardium and reduction of scar size. To improve cell engraftment, cardiospheres (CSps, three-dimensional cells taken from minced heart tissue) have been suggested as an alternative. A major concern of this approach is the inconsistency of cells found within the cardiospheres. This project takes components from both the traditional single cell adoptive transfer method and the use of cardiospheres to design a three-dimensional structure composed of cardiac progenitor cells. Currently it is known that the human heart contains a c-kit+ progenitor cell population (CPC), but it has not been shown that the heart contains other progenitor cell types. To establish the presence of these populations, we used Miltenyi Biotec's Macs Technology to sort cardiac tissue from heart failure patients receiving a left ventricular assist device (LVAD). Presently two cell populations have been characterized with morphological and cellular characteristics similar to endothelial progenitor cell (EPC) and mesenchymal stem cell (MSC) populations. Through gene expression analysis, differentiation assays, FACS, and Immunocytochemistry, markers specific to each cell type have been examined. EPCs are integral in the formation of blood vasculature and MSCs secrete paracrine factors that are pro-survival stimulating proliferation, angiogenesis, and the recruitment of progenitor cells. We hypothesize that the combined support of these distinct cell types will enhance the regeneration already reported with hCPCs. This study will examine the proliferation and differentiation capabilities of these co-cultured cells to demonstrate their superior regenerative ability. The ability to reconstitute a niche that can survive the hostile environment caused by prolonged ischemia and hypoxia would address current limitations associated with stem cell therapy. These results could greatly impact stem cell regeneration by creating a more effective therapeutic intervention for patients suffering from heart disease.

Session C-1
Oral Presentation: Ecological Science
Friday, March 8, 2013, 1:00 pm
Location: Library Addition 2203

276 1:00 pm
Antibiotic resistance of Pseudomonas putida to ciprofloxacin (CIP) at environmentally relevant concentrations
Mark Rein, Environmental Engineering (U)
Tyler Radniecki, Civil, Construction, & Environmental Engineering

Antibiotics are not highly metabolized by the human body nor are they effectively treated by wastewater treatment plants. Thus, pharmaceuticals and antibiotics enter into the aquatic environments through municipal wastewater effluents. There are concerns that chronic exposure to environmental concentrations of antibiotics may lead to an increase in abundance of antibiotic resistant bacteria. This study examines if Pseudomonas putida, a soil bacterium and cousin to the pathogenic Pseudomonas aeruginosa, can develop antibiotic resistance to ciprofloxacin (CIP) at environmentally relevant concentrations. CIP is a synthetic broad-spectrum antibiotic commonly found in environmental soils and waters. Batch growth assays using 96-well microtiter plates were used to expose P. putida to CIP daily at concentrations ranging from 1 ppt – 1 ppm (concentrations reported in environmental soils). After exposure to environmental concentrations of CIP, P. putida was exposed to clinical concentrations of CIP to determine the minimum inhibitory concentration (MIC). The MIC is the lowest concentration that prevents all growth of P. putida and is determined by measuring the absorbance at 600 nm (OD600) after a day of exposure. Over
Rattlesnake Encounters Alter Vigilance Behavior of California Ground Squirrels (Spermophilus beecheyi)

Rey Ayon, Biology (U)
Rulon Clark, Biology

Evolutionary persistence theory explains the sustenance of ecologically relevant—and seemingly maladaptive-structural, physiological, or behavioral features in species as products of historical periods of natural selection. In the California ground squirrel, evolutionary persistence is used to explicate the conservation of innate and stereotyped snake responses. At the onset of snake recognition, ground squirrel taxa comprising virtually every extent of phylogenetic sympathy with snakes invariably respond to both rattlesnakes and gopher snakes with elongated postures, tail-flagging, tail hair piloerection, and focused attentiveness. Some degree of awareness of the snake’s microhabitat preference is also maintained long after a snake is no longer visible. Squirrels will readily treat their environment-particularly the snake’s original location—with elevated caution as a snake-primed “weariness” or inference of localization. Although variability exists in the exact amount and organization of antisnake defenses, the stark contextual differentiation engendered by the identification of a snake has resulted in ritualized preliminary and subsequent responses to snakes in most ground squirrel lineages. Experiments with lab-reared pups that were isolated from natural environmental learning processes have grounded the aforementioned snake-specific reaction as an innate development, evincing its evolutionary stability. However, there is insufficient evidence to demonstrate its efficacy in identifying snakes during subsequent environmental interactions. If this generalized response to snakes is evolutionarily stable, a snake encounter should bias a squirrel’s subsequent investment of investigatory behavior towards snakes to increase their perceptibility of predation in the environment. Adult ground squirrels from the Diablo Mountain Range in San Jose, CA were selected for field presentations that effectively mimicked snake predation situations. Squirrels were shown live tethered Northern Pacific rattlesnakes, rattlesnake models, and novel objects. We quantitatively described degrees of vigilance as indicated by antisnake defenses and measured amounts of time spent investigating snake models and novel objects before and after encountering a live rattlesnake. It was found that squirrels spent more time investigating models and novel objects after being primed with live rattlesnake confrontations. Squirrels also exhibited snake-discriminatory behavior towards rattlesnake models by showing significantly higher tail flag rates. Further analyses will reveal the effect of rattlesnake encounters on predation vigilance and deterrence behavior.

Identifying the Causes and Consequences of Larval Growth and Survival in grass rockfish (Sebastes rastrelliger)

Claire Andrews, Biology (U)
Todd Anderson, Biology

Oceanographic conditions and maternal provisioning can influence the growth, survival, and delivery of larval marine fishes to coastal habitats. Recent evidence suggests that older female rockfishes (Sebastes spp.) produce offspring of higher quality and release their larvae earlier during the reproductive season. Variation in maternal investment along with seasonal variation in upwelling-driven food availability may have strong effects on the growth and survival of larval rockfishes that, in turn, influence their transition from open water to bottom habitats (i.e. settlement). To evaluate the biological and oceanographic drivers of larval growth and survival, I compared the growth of young grass rockfish (Sebastes rastrelliger) across a season of relatively high primary productivity. Recently settled rockfish were collected weekly from April–September 2010 in Bodega Harbor, CA. Juvenile rockfish were also collected 1 month after the last settlement event and used to determine whether larval traits, including growth and parturition (birth) date were disproportionally represented in surviving juveniles, indicating that particular traits are advantageous for survival. Otolith microstructure analysis was used to determine growth and parturition date of collected fish. My results suggest that growth is driven primarily by seasonal patterns of food availability. Concurrently, trends in sea surface temperature, salinity, and alongshore wind speed, representative of upwelling events, provide insight into the relative importance of these variables to successful settlement in this fish.
279  1:45 pm

**Eelgrass Habitat Loss and Biodiversity: Structural Complexity Modifies Effects of Disturbance on Epifauna**

Alterra Sanchez, Biology (U)
Kevin Hovel, Ecology

Habitat loss influences community structure in terrestrial and marine systems. However, theoretical and empirical evidence suggests that community structure may not change with habitat loss until a threshold of loss is reached, causing a non-linear relationship between loss and biodiversity. In seagrass habitat, disturbances at multiple scales fragment patches causing a continuum of habitat loss and fragmentation, but structural complexity (e.g., shoot density) also varies among patches. We used artificial eelgrass (*Zostera marina*) patches to test whether structural complexity modifies effects of habitat loss on epifaunal community structure. I specifically tested the hypothesis that low structural complexity would decrease the threshold amount of loss necessary to reduce biodiversity. We allowed artificial eelgrass patches of each of three shoot densities to be colonized by epifauna in San Diego Bay, CA. We then removed different amounts of habitat from each patch to create a continuum of habitat loss (0 – 90%) for each shoot density treatment. The hypothesis was supported: species richness and epifaunal density decreased after a threshold of loss (70%) was reached, but only in the low shoot density treatment. However, multivariate analyses revealed that the major driver of community composition was structural complexity, rather than habitat loss. In conclusion, medium and high seagrass structural complexity mediated loss of biodiversity when fragmentation occurred.

280  2:00 pm

**Characterization of Extremophiles from National Parks using the 16S gene**

Harmony Saunders, Biology (U)
Richard Bizzoco, Biology

Microorganisms thrive in all areas of our environment and science has made a remarkable feat discovering their presence years ago. Since the invention of a microscope and the discovery of microscopic life, new research, insight, and technology have arisen. Using sequencing technology and certain genes, microorganisms can be characterized and described in a phylogenetic relationship. The commonly used gene is the 16S gene that contains six hypervariable regions and many conserved regions, making it an ideal gene to compare amongst organisms. The use of next generation sequencing technology can use the entire genome of an organism to analyze an environment or study a given area. In this project, samples were taken from Lassen Volcanic National Park (LVNP) and analyzed using cloning and Sanger sequencing technology. Some sites have been successfully cultured at high temperatures (85°C), which produced additional information regarding the unclassified organisms. The DNA isolation of these organisms has proven difficult; as this site is a hydrothermal vent which functions in a fumarolic cycle at high temperature and low pH. The organisms that thrive in this environment have developed a unique mechanism to adapt to their extreme environment. The challenging task of extracting the DNA from these highly adaptable organisms and characterizing their phylogenetic relationship is the focus of this research. Other methods have been used in order to describe the microorganisms including fluorescence in situ hybridization (FISH) that fluorescently labels a specific nucleotide sequence. These techniques have provided some characterization, but more work is still needed to provide phylogenetic relationships.

281  2:15 pm

**It's a little bit fishy: Standardized diet compositions for phocid seals**

Meghan Smallcomb, Marine Biology (U)
Annalisa Berta, Biology

Phocids (seals) are a cosmopolitan group of marine mammals that are secondarily adapted to life in the water. The objectives of this study were to 1) calculate diet composition for all 18 extant phocid species, and 2) examine the diet composition of threatened and endangered phocid species in order to investigate the role of diet in the decline of these species. A comprehensive literature search was conducted in order to quantitatively describe diet composition in all extant phocids. Prey was divided into 19 categories of prey types based on taxonomic class. Standardized diet compositions were calculated for the 18 species of phocids based on published accounts of stomach, intestine, and scat contents. Total energy density of diets was calculated for each species. Based on our results, phocids eat three major types of prey: fish (7 species), cephalopods (2 species), and crustaceans (1 species). The one exception to this is the ringed seal (*Pusa hispida*), which eats large proportions of both fish and crustaceans. Several phocid species are threatened due to climate change, habitat destruction and anthropogenic factors. In general, threatened species ate prey with lower energy densities than nonthreatened species. This was the first time standardized diet was calculated for the endangered Caspian seal (*Pusa caspica*), which was found to eat predominately endemic fish species. This study was the first to calculate the standardized diet for all phocid species and the first to investigate the relationship between phocid diets and conservation.
282 2:30 pm

The Patterns in the Plates: An Investigation of Baleen Ultrastructure in the Fin Whale (Balaenoptera physalus)
Nicholas Zellmer, Biology (M)
Annalisa Berta, Biology

Baleen whales (Cetacea: Mysticeti) have attained their colossal size through the exploitation of a novel ecological niche using a unique adaptation: baleen. A rack of baleen consists of serially placed, horn-like plates that are fringed with bristles on the lingual side. The bristles act as a sieve allowing the whales to capture large batches of prey during a single feeding event. Relatively little is known about the ultrastructure of baleen and how it differs within an individual. The objectives of this study were to describe 1) the intra-rack variation in plate ultrastructure, 2) the intra-rack variation in calcium salt deposition within the tissues of the baleen plates, and 3) the ontogenetic variation in baleen ultrastructure. For an adult and a juvenile fin whale (Balaenoptera physalus), samples were taken from the labial side of plates and analyzed using light microscopy, transmission electron microscopy, and x-ray compositional analysis. Basic structure, patterns, and composition were described for sample sites in all 4 quadrants and contrasted between adult and juvenile individuals. Preliminary results show striking intra-rack differences in the ultrastructure and composition of the baleen plates, including marked differences in mineralization between adult versus juvenile tissue. Future work will focus on contrasting these results with samples from the racks of a juvenile and adult gray whale (Eschrichtius robustus).

Session C-2

Oral Presentation:
World History and Sustainable Development
Friday, March 8, 2013, 1:00 pm
Location: Love Library 430

283 1:00 pm

Women in Early Islam
Monique Martinez, History (U)
Sandra Campbell, History

Discussion of early Islam is not common in Western society and it is even more rare to involve women in this discussion. Women in and around the life of the Prophet Muhammad had interesting lives representing different roles in society. Prominent women such as Khadijah bt. Khuwaylid and Hind bt. Utba were extremely powerful women. Khadijah was a business woman and Hind went to great lengths to avenge the deaths of her brother and father. Additionally, there were women who participated in battle by urging the men to fight their enemies, such as ‘Amrah bt. ‘Alqamah al-Harithiyyah. Looking at primary sources from early Islam, there is information on or relating to women during the life of the Prophet that can be analyzed to gain understanding of their roles in society. Also, women were mourners within the community, openly and actively mourning the deaths of people within the community. Furthermore, the analysis will still be framed in the original translator’s voice so that the work is done with a historiography approach. For example, it is evident that women played a consistent role as oral transmitters of their history. Part of the reason women were transmitters is because they were trusted sources of information especially the women, such as Fatimah and ‘A’ishah, who were close to the Prophet and his closest advisors. These stories of and by women are often used to advance a certain message that the transmitters wanted to pass along. The research will shed light on women’s place in early Islam which often encompassed unique and unexpected roles.

284 1:15 pm

The Discourse of Sustainable Development
Ariel Rawson, Interdisciplinary Studies (U)
Dr. Fredrick Conway, Anthropology

My research attempts to decenter the definition of sustainability utilized in global sustainable development discourse and policies as well as illuminate definitions that challenge the dominant society-nature relations. In 1987, the term ‘sustainable development’ officially entered the global stage with its use in the World Commission on Environment and Development. Since then, the term has spread rapidly and been adopted by a broad array of stakeholders and agendas. Although introduced as a novel solution to the burgeoning global social and environmental problems, the concepts and premises underpinning the term are historically situated in a body of ideas from Western notions of developmentalism and environmentalism. The interaction of the two frameworks resulted in a discourse that can be characterized by a call for global, technical, and scientific solutions that universalize assumptions of society-nature relationships based on scarcity, efficiency, and risk. This definition is not only based on the compatibility between environmental concerns and the development agenda, but also further centralizes power in the hands of those responsible for a disproportionate amount of the damage. In contrast, one alternative understanding of sustainability and society-nature relations that challenges the development epistemology originates from the Andean concept of Buen Vivir. The concept stresses pluralistic and context specific solutions premised on sources of value beyond economic reductionism to include cultural, historical, and spiritual sources.
ABSTRACTS

285 1:30 pm
Aishah Bint Abi Bakr and the Battle of the Camel: Evolving Islamic Conservatism’s Effect on the Presentation of Her Legacy
Mary Clipper, History (U)
Sandra Campbell, History

Aishah bint Abi Bakr, remembered as a beloved wife of the Prophet Muhammad, was not the first woman to lead men into battle or to fight valiantly beside them. Arabian and early Islamic traditions give examples of these strong women. Aishah was criticized and condemned for her role in the Battle of the Camel. This battle was the first to pit Muslim against Muslim and the spark of the first Islamic civil war. The criticism of her involvement in this battle was based on the assumption that she disobeyed the Prophet Muhammad’s instruction to the wives of the Prophet to stay in their homes. My research posed the following questions: Placed in the context of the Quranic order regarding the seclusion of the wives of the Prophet, was Aishah disobedient in her actions? Was it unprecedented or uncustomary in Arabic history for a woman of prominence to go into or lead men in battle? Did the criticism of Aishah’s decision to accompany men in the fight for the aim of *islah* (a restoration of the law) evolve over time and was it influenced by the political leanings of the authors? For my research I analyzed medieval Arabic primary sources and respected modern historians. I concluded that by examining the sources it can be argued that Aishah was not going against the wishes of the Prophet, it did not go against Arabic custom for a woman of social prominence to go into battle, and more importantly, a comparison of the accounts of early and medieval historians and Sunni and Shi’i authors, prove that the depictions of early Muslim women, including Aishah, have been reworked to better fit a particular political stance and the evolving conservative moral restrictions on Muslim women beginning during the medieval period. Evolving Islamic conservatism shaped the presentation of the traditions by medieval historians in a way that became more critical of Aishah. This criticism helped to support the tightening of the moral codes of conduct on women and to color history to support the divisions that had emerged in Islam.

286 1:45 pm
The Making of the “Fall” of Rome: The Transformation of the (His)toriography
Javier Gonzalez-Meeks, History (M)
Elizabeth Pollard, History

The influence and experiences of women, especially their status and social roles, have been ignored by “fall” of Rome historians. These historians, namely Brian Ward-Perkins and Peter Heather, represent women primarily as objects instead of subjects, and as having little to no influence, positive or negative, in the “fall.” Personal biases and current events have shaped how contemporary Roman (his)torians have approached and reconstructed the “fall” of Rome paradigm. Ward-Perkins and Heather have attributed Rome’s “decline and fall” primarily to Christianity and “barbarians,” while neglecting to incorporate a gendered analysis in their “fall” paradigms. The “fall” historians focus almost exclusively on the experiences of elite Western Roman men, and this lack of a gendered analysis contributed to the conclusions of “decline and fall” espoused by these historians. This paper addresses this problem in three parts; the first part examines Late Antique primary sources regarding women’s experience, status and expectations. The second part evaluates the role of women in Edward Gibbon’s *The History of the Decline and Fall of the Roman Empire* (1776). The third part examines the paradigm shift of Late Antiquity. Postmodernist social historians in the late twentieth century challenged conventional grand narratives, such as the “fall” paradigm. This paper argues that traditional periodizations of the “fall” of Rome and the idea of a “fall” are no longer accurate when analyzing the status and experiences of women in the Roman world. When the experiences of women are incorporated into analyses of Roman history, the reoccurring “fall” paradigm found within the (his)toriography ceases to be accurate.

287 2:00 pm
Assessing disaster recovery in an ethnic minority community of the Western Solomon Islands
Savanna Schuermann, Anthropology (M)
Matthew Lauer, Anthropology

Contrary to common perceptions, natural disasters are not simply the result of extreme physical events like earthquakes, cyclones and tsunamis, but rather they occur at the intersection of a natural hazard and a socially vulnerable group of people. It is the vulnerability of a group or individual that largely determines the severity of a hazard’s impact as well as the ability to recover, a process influenced by broader social and political processes such as ethnic marginalization and regional exchange systems. This research analyzes the impact of a 2007 tsunami on two communities in the Western Solomon Islands and compares the recovery of a Melanesian community with that of an ethnic minority Micronesian community, Titiana. Preliminary research indicates that, in comparison to nearby Melanesian villages, ethnic minority communities experienced a more severe impact and their pace of recovery has been slow and problematic. The purpose of this research is to understand (1) how political and ethnic vulnerability shape post-disaster recovery in Titiana, (2) and how this vulnerability has produced a less successful recovery in Titiana, relative to nearby Melanesian villages. This research involved household surveys, focus groups, ethnographic and key-informant interviews, participant-observation, and document analysis. Household surveys were random, but spatially stratified in each community. Participants for focus groups and
interviews were recruited based on their areas of expertise, knowledge, and experience surrounding the tsunami and ensuing years of recovery. This project builds on disaster research that demonstrates natural disasters are produced by natural and social processes and that natural disaster outcomes are shaped considerably by the social context and vulnerability that characterize affected individuals and groups. Moreover, results from this research will also help improve future disaster planning, mitigation, and recovery efforts.

288  2:15 pm

Kurt Schumacher, Rearmament, and the Opposition
Schorsch Kaffenberger, History (M)
Lawrence Baron, History

My current research specifically examines Kurt Schumacher and the Social Democratic Party (SPD), who strongly opposed U.S. foreign policy that supported the creation of a new German army in West Germany between 1945-1952. As a result of Kurt Schumacher’s opposition to West German rearmament, U.S. officials in Germany developed methods to silence Schumacher’s opposition in the West through popular media outlets such as the New York Times, Time, and other American newspapers that were published in West Germany. Integrating newspaper articles, speeches, letters, and political party pamphlets from Kurt Schumacher and the SPD from the archives in Bonn, Germany, and presenting Central Intelligence Agency (CIA) declassified documents from the Truman Library have enriched my research thus far. Integrating these documents will help explain why many American politicians and diplomats in Germany feared and genuinely disliked Kurt Schumacher, as opposed to their friendly relations with Germany’s first Post-War Chancellor Konrad Adenauer. This is one of the primary reasons why my research is relevant, original, and innovative in analyzing post-war German-American relations. This research will reveal the extreme measures that American politicians and government used toward Kurt Schumacher’s growing popularity in West Germany. It will also expose the propaganda methods used by U.S. governmental departments such as the Office of Strategic Services (OSS), and the Psychological Warfare Division (PWD) in Germany to vilify Schumacher up until his death in 1952, and secretly implement American values such as democracy and capitalism in the media. Schumacher played a critical role in how political developments in West Germany would be shaped. For U.S. officials and diplomats, media influence would persuade the American public that U.S. efforts to democratize and rearm West Germany was not only the suitable way to protect West Germany from Soviet rule, but also allowed the American public to identify the “good” and “bad” politicians in West Germany such as Kurt Schumacher and Konrad Adenauer. It was presumed that Konrad Adenauer was going to move the country forward with his support of Allied policies and the establishment of a West German Army, or Schumacher whom the American media vilified with socialist and nationalistic labels. Moreover, both of these charismatic political figures represented two different and often misunderstood political traditions.

Session C-3
Oral Presentation: Technology, Self, and Society
Friday, March 8, 2013, 1:00 pm
Location: Love Library 431

289  1:00 pm

Exploring the Effectiveness of Advertising Disclaimers on Digitally Enhanced Images
Steven Shyne, Marketing (U)
Paula Meter, Marketing

Re-touched images have characterized the advertising industry for at least the past 25 years and have been considered acceptable as long as the images portrayed were not misleading by exaggerating the effect that could be achieved with the product advertised. However, in light of the increase of eating disorders and self-esteem issues among young generations, public policy makers and academic researchers have started to question the negative effects of these images on body satisfaction among young adults. With a meta-analysis of experimental and correlational studies, Grabe and colleagues (2008) suggest that increased exposure to thin ideals for women is associated with higher levels of body dissatisfaction, and research by Slater et al. (2012) provide some initial evidence that advertising disclaimers on digitally enhanced images might decrease these effects. The aim of this study is to further develop work by Slater et al. (2012) and explore the effects of advertisement disclaimers on a person’s temporary body dissatisfaction considering gender and different levels of emotional intelligence (Salovey and Mayer 1990).

With a two-factors experimental design (ad disclaimer present or not present) and a convenience sample of 274 subjects (143 males and 131 females), we test the hypothesis that young individuals who view images with an advertising disclaimer will report temporary lower levels of body dissatisfaction than participants who view the same images with no advertising disclaimer. Additionally, we hypothesize that EI is an important moderator of the effect, with young adults with a high EI being less susceptible to the effects of digitally enhanced images. 

Our preliminary results suggest that EI does significantly (p<.05) moderate the effect of advertisements on body dissatisfaction. Individuals who have high levels of EI seem to be the least affected by the ads (lowest level of body dissatisfaction) regardless whether the ad has a disclaimer or not. High EI individuals seem to be able to self-control their emotional response and mitigate the effect of exposure to an unrealistic advertisement.
This research contributes to the understanding of the effectiveness of the use of advertising disclaimers in young adults and the role of EI in processing unrealistic images.

290  1:15 pm  
Computers, Can They Think Like Humans?  
Phillip Kim, Philosophy (U)  
Mark Wheeler, Philosophy  
In this presentation, I am responding to Alan Turing’s famous Turing Test to prove that computers, even if computers were able to pass the Turing Test, do not have the capability to think and in turn, will not have the capability to think like humans. Using John Searle’s Chinese Room thought experiment with a combination of what Qualia is, it becomes evidently clear that computers cannot think like humans can.

291  1:30 pm  
Accessibility to Information Toward Self Expansion Through Conversational Dynamics and Positive Orientation for the Public’s Enlightenment  
Nicholas Passanisi, Kinesiology (U)  
Steven Barbone, Philosophy  
Everyone has access to creativity; however, such a skill-set must be nurtured. If people were exposed to stimulating thought and positivity as well as reflected upon the structure of dialogue as presented, then the public good would progress by the sharing of ideas through enlightened thinkers. “Now[here] Mist” podcast will be actualized through technological logistics—microphones, location, distribution, supplies, name and introduction—with free will of conversation encompassing the structure, topics, questions, positivity, and creativity. This will result in the proliferation of dialogue and innovation among the population which will transcend societal norms.

292  1:45 pm  
iExposé: A critical look at our use of smart-phones and tablets  
Allison Schulz, Liberal Arts & Sciences (M)  
William Nericcio, English and Comparative Literature  
Handheld, web capable, multimedia devices like the iPhone, iPad, iPod Touch, and the Kindle Fire are undeniably popular. Yet owning one of these high-tech devices has much more widespread implications than most people now realize. There are physical and social hazards related to the production, use, and post-use phases of these electronics. By encouraging irresponsible consumption the makers of these devices are ensuring we not only change our habits, but we change in a way that brings them and only them enormous profits.

My research will draw upon the theories of Freud, Lacan, Adorno, and Marx. I will first discuss how these technologies have become addictive distractions and/or substitutions for critical thought. I will then explore how these particular devices and their respective companies gain social and economic power via their technique of aligning forces and monopolizing the market. Finally, I will discuss the technologies from a political economy of culture standpoint. This will specifically be in regards to the environmental and human hazards of production, and the dangers of our current system of disposing of electronic waste.

By discussing this topic I hope to start a discourse on the downsides of these technologies—many of which are hidden from sight. I would like to critically present both the products and the cultural messages that are contained within, from several perspectives. When others are more aware of the problems real changes can be made in our relationship with these devices.

293  2:00 pm  
The Face of New Feminism: Accessibility and the Rise of the Digital Age  
Jennifer Carter, Liberal Arts and Sciences (M)  
William Nericcio, English and Comparative Literature  
This oral presentation describes the accessibility of current, collective feminism as it relates to new technology spanning across several different platforms. In order to reach younger feminists today, gender justice must be fought on the playing fields in which a younger generation can relate to, and which reaches the widest possible audience. With the explosion of the blogosphere and social media, the feminist cause will be able to gain ground on the platform of this modern technology. Feminism can be understood by everybody and for everybody with the success of the Internet. Young feminists are responding well to easily digestible and compact sources of material in this fast-paced world we now find ourselves in. The Internet, blogs, online social media and networking sites, as well as other digital technology speaks today’s language, incorporating all genres, sexes, and genders of peoples into feminist discussion. Not only are seasoned feminists able to use new technology to reach a wider audience, but the mass appeal of convenience and accessibility has opened the door for an entirely new group of feminists to stand up and speak out. I’ll be investigating how online communities are changing the face of feminism to include new voices from every corner of the world. As a transformational tool for social movement, the digital age will be able to achieve a collective action, activism, and individual realization that the feminist cause was never able to achieve before.
294 2:15 pm

How Prior Relationships can be used to Predict Cyber-Tactics in Online Stalking Cases

Russell Holm, Communication (M)
Brian Spitzberg, Communication

In the information age, new communication technologies (e.g., the internet, cell phones/smart phones, etc.) have provided new forums in which stalking behaviors can thrive. These technological advances have given rise to a new type of stalking—cyberstalking (Piotrowski & Lathrop, 2012; Sheridan & Grant, 2007). In order to avoid confusion regarding the different stalking realms, the current paper will refer to stalking behaviors conducted in the real-world as physical or offline stalking and stalking behaviors conducted through communication technologies as online or cyberstalking. Cyberstalking has been defined as in a variety of ways throughout the literature, however, Bocij and McFarlane’s (2002) definition appears to be one of the most widely accepted (Alexy, Burgess, Baker, & Smoyak, 2005; Horn, & Hughes, 2009; Piotrowski & Lathrop, 2012). Cyberstalking is defined as a set of behaviors that can be utilized by individuals, groups of individuals, organizations, or corporations to harass one or more individuals through computer-mediated communication systems (Bocij & McFarlane, 2002). These sets of behaviors can include the theft of identity and data, solicitation of minors for sexual purposes, computer monitoring, transmissions of threats and false accusations, and the damage to equipment or data (Bocij & McFarlane, 2002). Similarly to the legal definition of stalking, harassment as it pertains to cyberstalking is referred to as a pattern behavior that would cause a reasonable person to experience fear or emotional distress (Bocij & McFarlane, 2002). Despite the growing public awareness of cyberstalking there has been little research conducted on this issue with the intent to predict and explain these groups of behaviors. The current paper will investigate the phenomena of cyberstalking by examining the interconnectedness of the prior relationship between the perpetrator and their victim, the different types of cyberstalkers, and the cyber-tactics used to inflict harassment. I argue that the aggregation of these three components will allow for the prediction of online stalking behaviors.

295 2:30 pm

Love Online: A Study of Long-Distance Romantic Relationships and the Use of Video Chat to Engage in Sexual Behavior

Anthony Johnson, Communication (M)
Peter Andersen, Communication

Long-distance romantic relationships are difficult to maintain because of the lack of face-to-face interactions that comes with geographic separation. As computer-mediated communication has become popular, new channels of communication have become available that allow for easier relational maintenance. This study seeks to identify to what extent those in long-distance relationships utilize online communication (specifically, video chat) in order to keep long-distance romantic relationships in repair. It will also examine what factors may be related to higher levels of this computer-mediated communication. A questionnaire was given to 651 undergraduate students and will measure relational satisfaction, nonverbal immediacy, and sexual intimacy to examine how they affect relational maintenance through computer-mediated communication. Results indicate that the use of new media is related to sexual behaviors through video chat (SBVC), that sexual intimacy is positively related to the use of SBVC, but also that relational immediacy had a low, negative relationship with the use of SBVC. Keywords: long-distance romantic relationships, sexual behavior, video chat

Session C-4

Oral Presentation: Work, Families, and Policy

Friday, March 8, 2013, 1:00 pm
Location: Love Library 410

296 1:00 pm

Fathers' Effects on African-American Male Educational Utility

Terence Ellis, Psychology (U)
Luke Wood, Administration, Rehabilitation, and Postsecondary Education

This study examined how fathers affect their African American male son’s degree utility. Utility refers to how useful students’ view their educational pursuits. Specifically, this study examined three primary variables relevant to students’ fathers, including: father’s presence in the home, father’s degree aspiration for their student, and father’s highest level of education. We hypothesized that all variables would be positively predictive of student utility. Data employed in this study was derived from 1,004 African American male high school students from the Educational Longitudinal Study (2002). After controlling for school, home/family, and student characteristics, findings revealed that father’s presence in the home was not a determinant of utility. However, father’s desire for degree aspirations of the student was a positive predictor of student’s utility. Interestingly, analyses indicated that father’s highest level of education was negatively predictive of student’s utility. The model accounted for roughly 19% of the variance in utility. Recommendations for further research are suggested.
297  1:15 pm
Long-term Structural Changes to Familial Ties Due to Emigration
Jose Huizar, Anthropology (M)
Ramona Perez, Anthropology

Mexican emigration to the United States over the last four decades has reshaped the social fabric of Mexican families and communities. Communities that face high rates of outmigration confront a cultural shift that is redefining what it means to grow old in Mexico. The effects of outmigration have on the transfer of remittances, family separation, labor, and the economy have been studied in detail, however, today we are seeing the long-term cultural shifts that take place when several generations have participated in migrating from Mexico to the U.S. As a large migrant community, San Pablo Huixtepec, Oaxaca, offers valuable insight into how the elderly in Mexico are experiencing the longstanding effects of outmigration. The purpose of my research is to explore what it means to be a senior community member in rural Mexico in the twenty-first century, by capturing the lived experiences of several elderly individuals who form part of a senior community support organization called ‘11 de Octubre’. My research will consist of two phases. In the first phase I will survey members in order to explore members’ ages, number of immediate relatives (sons, daughters, husband, and wives) who are living in the U.S. or elsewhere, household size, and ages of those in the household. In the second phase of data collection I will use qualitative methods: participants will be interviewed individually and in focus groups. I will use grounded theory to formulate a hypothesis about how outmigration has reshaped the sociocultural conditions for the elderly who stay in sending communities. By better understanding how migration is affecting not only immigrants in the U.S., but also those who are back in sending communities, transnational policy makers might be better informed as to how their policies manifest in the long-term.

298  1:30 pm
The Flexible Family
Damien Sutton, Women’s Studies (M)
Doreen Mattingly, Women’s Studies

For this conference I hope to present my research concerning the discourse of family and how it is used by the Argentinian government and the World Bank to further the neoliberal economic goals of the nation. Specifically, I will discuss how the discourse surrounding family is transformed by the economic collapse of 2001 and how both the government and the World Bank used programs, specifically PROFAM (Family Strengthening and Social Capital Promotion Project), that promoted a recomposition of gender roles in the household to buoy a failing economy. In order to truly examine the transformation of the discourse, I will analyze structural adjustment programs implemented by the Argentinian government and the World Bank between the mid-1980s and the late-1990s that are predicated upon a very specific idea of family in the country. Specifically, I shall examine the Maternal and Child Health and Nutrition Project of 1995. By doing this, I am more readily able to define the discourse on family during this period, which will provide a more meaningful point of comparison when examining the new discourse that is created by the fall of the Argentinian economy. Next, I will explain how because of the economic crisis, which gave rise to an increase in activity in the informal sector for both men and women (though mainly women), the government needed to reexamine the idea of family and recreate the cultural dialogue concerning it in order to protect neoliberal ideology in the country. This demonstrates that while the material world is often shaped by various global discourses; a discourse can be forced to change by the material world in times of crisis in order to protect the more powerful institutions that directly benefit from the discourse.

299  1:45 pm
Role Blurring and Work-Life Conflict: The Effects of Work and Non-Work Demands and Resources
Renee Payne, Applied Psychology (M)
Kate Hattrup, Psychology

Work-family role blurring occurs when individuals have perceptions of uncertainty or difficulty distinguishing between their work and family roles (Desrochers, Hilton, & Larwood, 2005). One of the most compelling aspects of role blurring is that it can occur not only at work, but outside of work as well. As communication technology and work flexibility become more common, role blurring poses new challenges for individuals, families, and organizations (Ilies et al., 2009). Specifically, the few studies that have examined the effects of role blurring have shown that it leads to greater work to family conflict, especially for married people with children, and that certain work conditions, namely work demands and resources, can moderate this relationship (Desrochers et al., 2005; Glavin & Schieman, 2012). The present study expanded upon the work of Glavin & Schieman (2012) and added to the current discourse in three main ways: first, it broadened the concept “family” to mean “personal” when considering role blurring, demands, resources, and conflict; second, it investigated work and non-work resources and demands as moderators of the role blurring and work-life conflict relationship; third, it examined both directions of conflict as outcomes of role blurring. Moreover, the present study improved upon existing measures of non-work resources and non-work demands. A pilot study collected data from 39 participants through a snowball sample technique to check and revise the instruments. A main survey was administered using MTurk to 403 full-time employees. Pearson correlation and multiple regression analyses investigated the relationships of interest. Results showed that role blurring significantly predicted work-life conflict.
However, resources and demands stemming from the work and non-work domains did not significantly strengthen or weaken the relationship between role blurring and work-life conflict. However, the effects were in the expected direction. The implications of these findings for individuals and organizations will be discussed.

300  2:00 pm

‘A little piece of home’: Geographies of the Home Front on the Frontline
Denise Goerisch, Geography (D)
Kate Swanson, Geography

In 2012, the Girl Scouts of San Diego celebrated their 10th year of Operation Thin Mint, which donates thousands of boxes of Girl Scout cookies to military soldiers overseas. American soldiers, both in and out of the field have expressed their gratitude towards the Girl Scouts as a box of cookies ‘brings a little piece of home’ to them while on the frontline. For many soldiers, a box of thin mints or samoas evoked feelings associated with the home front such as warmth, support, and innocence, which is a sharp contrast from the violence and loss experienced on the frontline. For over a century, the frontline has been conceived by the US military as ‘over there,’ a space separate from the home front, rifled with violent conflict whereas the home front has been produced as feminine space in need of protecting from foreign invasion. However, in these times of geopolitical unrest, the lines between the home front and frontline are becoming blurred, especially when the everyday experiences of the home front are increasingly militarized. While geographers and other social scientists have extensively discussed the militarization of the home front, few have examined the gendered embodiment of the home front on the frontline. Furthermore, this research will contribute to how American society defines the ever-changing warscape. Based on ethnographic fieldwork conducted from 2010-2012 on the Girl Scouts and an analysis of soldier testimonials, news articles, blogs, and Youtube videos, this research examines how the home front is constructed on the frontline through Operation Thin Mint. From data collected from observations, interviews, and focus groups, I conclude that when the home front ‘invades’ the frontline, the frontline comes to embody the home front despite military efforts to keep the two fronts separate.

301  1:00 pm

Classification of Autism Brain Imaging Data Using Machine Learning Algorithm
Colleen Chen, Computational Science (M)
Ralph-Axel Mueller, Psychology

Autism spectrum disorder (ASD) is a developmental disorder characterized by sociocommunicative impairment. Accurate diagnostic classification of functional connectivity MRI (fcMRI) data from ASD vs. typically developing (TD) brain is a promising tool for the identification of complex biomarkers. Despite strong evidence of aberrant connectivity, most attempts to classify ASD from TD using fMRI data still perform just above chance. In the present study, we performed feature selection using particle swarm optimization (PSO) algorithm for improved classification performance of a support vector machine (SVM) on ASD and TD fcMRI data.

PSO is a stochastic optimization algorithm useful for searching high-dimensional problem spaces. Its implementation here was based on Wang et al. (2007). We chose 264 regions of interest (ROIs) defined by meta-analysis in Power et al. (2011). For all possible pairs of ROIs, a feature was defined as the signal correlation between them. Twenty particles were initially randomized throughout the search space, where each particle’s position denoted a set of connections. The fitness of a particle was defined as the percentage of participants accurately classified using SVM with leave-one-out cross-validation. Based on the fitness score, each particle’s position was updated to be more similar to the particle’s individual best performance and to the globally best-performing particle. This process was repeated for 70 iterations, and the highest-performing particle was then further analyzed.

The highest-performing particle selected 78 connections and scored 88% classification accuracy. The 78 features included both overconnected (ASD>TD) and underconnected ROI pairs. Selected connections had an average Euclidean distance of 82.5 mm and were primarily inter-network (93%), as opposed to intra-network (8%). Of the ROIs included in these informative connections, 27% were in the default mode network (DMN) and 16% in the visual network.

Using PSO, SVM reached an 88% accuracy classifying fMRI data from ASD vs. TD participants. Selected most informative features were overall consistent with the literature, implicating primarily
302 1:15 pm

**Visual Object Pattern Separation Deficits Vary in Cognitively Normal Older Adults**

David Sheppard, Psychology (M)
Paul Gilbert, Psychology

Aging has been suggested to affect a mnemonic process called pattern separation—a mechanism that reduces interference among overlapping patterns of neural activation. Pattern separation separates partially overlapping stimuli and constructs multiple distinct neural representations that are more easily recalled. Recent studies used spatial tasks requiring pattern separation to examine the degree to which pattern separation decline varies with age. No study to our knowledge has investigated pattern separation variability among older adults for stimuli outside the spatial domain. The present study examined whether there is variation in pattern separation efficiency for visual object information in cognitively normal older adults. Participants completed a continuous recognition task measuring pattern separation during which objects were presented one at a time on a computer screen. Some objects were repeated across trials while other objects—labeled lures—were similar but not identical to previous objects. Lures were hypothesized to increase interference and thus heighten demand for pattern separation. For each object, participants indicated whether (1) this was the first time the object was seen during the task (new), (2) the object was seen previously during the task (old), or (3) the object was similar to an object seen previously during the task (similar). To examine variability in object pattern separation efficiency, an older adult group included in a previously published study (Toner et al., 2009) was divided into older impaired adults (OI) and older unimpaired adults (OU) based on performance on a standardized delayed word recall measure; OU were impaired relative to the young adult group but were not clinically impaired. Young adults and OU significantly outperformed OI when correctly identifying lures suggesting less efficient object pattern separation in OI. Young adults and OU were more likely to correctly label lures as similar, whereas OI were more likely to label lures as old. There were no significant group differences in correctly identifying first stimuli as new or repeated stimuli as old suggesting recognition memory was intact. These results are consistent with studies demonstrating variability in pattern separation decline in the spatial domain and support the idea that age-related cognitive decline varies.

303 1:30 pm

**Evidence In Men and Women for a Differential Role for Embodied Cognition of Ball Movement in a Targeting Task**

Michelle Louden, Psychology (M)
Robert McGivern, Psychology

Embodied cognition (EC) refers to the theory that perceiving movement can influence cognition. Studies of spatial tasks involving real or imagined movement show a differential, gender-related strategy. Men are biased toward a bottom-up strategy involving automatic processing of movement vectors, while women are biased toward a conscious, top-down approach that relies on moment-to-moment analysis. We examined whether EC is related to this gender difference using a computerized targeting task where participants observe a ball moving vertically at various angles from the bottom of the screen toward a horizontal line. The ball disappears beneath a masked area before reaching the line. After the invisible ball passes through the line, a paddle appears on the line and participants click on the line to indicate their estimate of the intersect point. This delay procedure uncouples perception from anticipatory motor movements while the ball is moving. We measured reaction times (RT) in 18 men and 17 women to identify the intersect point for a ball moving at 3.9 cm/sec and 7.8 cm/sec. We found that average RT decreased by 16% in men and 20% in women for the 7.8 cm/sec speed compared to 3.9 cm/sec (p<0.001). Since the paddle always appeared at the same time after the ball crossed the line, the decreased in RT provides evidence of EC in both sexes. RT was further examined with 15 men and 14 women using six ball speeds ranging from 4.6 cm/sec to 8.8 cm/sec. In this experiment, we also measured the amount of error in participant’s estimation of the intersection point. Results showed a significant linear decrease (p<0.001) in RT for both sexes as ball speed increased. In men, the decrease in RT showed no significant relationship with error, while the decrease in RT in women was significantly correlated with better performance (p<0.05). These results provide a robust demonstration of EC, though men and women may employ it differently. They also show improved targeting performance in women when top-down processing is limited by fast ball speeds. Together, these findings may help to better understand the basis of known sex differences in more complex targeting tasks.

304 1:45 pm

**Time Course of Inhibition Difficulties in Anxiety**

Joseph Boffa, Clinical Psychology (M)
Nader Amir, Psychology

Research suggests that an attentional bias for threat-relevant information contributes to anxiety. For example, in the probe detection task (PDT) anxious individuals show difficulty inhibiting attention deployment toward threat. However, PDT cannot index inhibition directly. Neurophysiological measures of inhibition, e.g.,
transcranial magnetic stimulation (TMS), can help delineate the role of inhibition when processing emotional information. TMS is a noninvasive method of introducing a magnetic pulse at the scalp that induces an electric field causing neurons to depolarize. When this depolarization occurs at the motor cortex (M1), one can examine the level of corticospinal activity by examining the magnitude of the motor-evoked potential (MEP) corresponding to the stimulated area of the cortex. Van Loon et al. (2010) found an increase in MEP amplitudes when a TMS pulse was presented before the presentation of a target, but more so for unpleasant emotional stimuli. The current study examined the effect of emotion using a paradigm more sensitive to cue validity to address inhibition in anxiety. Presentation of a pulse 50 ms before the presentation of a probe decreased cue validity effect whereas presentation of a pulse 50 ms after the presentation of the probe increased cue validity effect but only for negative emotions. Finally, anxiety was correlated with the degree of reduction of the cue validity effect for negative emotion. These results suggest that we can index the specific time course of inhibitory difficulties using TMS and that it may be possible to develop more targeted treatment for anxiety addressing this deficit.

Session C-6
Oral Presentation: Under and Above Ground
Research in Dynamic Communities
Friday, March 8, 2013, 1:00 pm
Location: Love Library 260

305 1:00 pm
44th Street Community Wrap Around Mobilization: Creating safe neighborhoods and changing systems
Devin Grindrod, Psychology (U)
Emilio Ulloa, Psychology

In this presentation I will talk about a grassroots community based participatory intervention. It is aimed at addressing community needs following the tragic shooting of a young resident. Rickquese Latra McCoy was murdered on his front lawn; he and two friends were shot at close range with 40 rounds of gunfire. The hundreds of residents on this very dense block were left traumatized by this event. Unfortunately this attack is not a lone incident. According to a special report by the Bureau of Justice Statistics (2007) about 8,000 African Americans are murdered each year, with 93 percent of these committed by other African Americans. The 2010 Census and San Diego Police assessments state that, City Heights represents only 5.5 percent of the city’s population, yet reports 12 percent of the violence, 20 percent of the gang unit investigations, and 25 percent of the homicides. This neighborhood has been highly traumatized, not only by this incident, but by the public systems as well. Some of the major problems faced by the residents are: poverty, homelessness, teen relationship violence, domestic violence, joblessness, and illegal immigration. The San Diego Compassion Project, which provides assistance and compassion to families of homicide victims, was invited to the McCoy residence shortly after Rickquese’s death. It was through this opportunity the residents decided to be proactive in solving problems in their community. They created a 15 page list of issues to be resolved, which can be grouped into the categories: activities, information & resources, relationship building, safety, and systems & policy change. Over the last seven months, the residents have gone through several trainings concentrating on trauma and conflict resolution in order to provide in-home and eventually school based services. Having treatment available in this way is important because this population typically will not seek help on their own. In order to decrease gang violence in the neighborhood, our youth intervention is modeled after the Office of Juvenile Justice Delinquency Prevention program. In this presentation, I will discuss the initial steps taken to assemble the intervention, community participation, proposed solutions, and accomplishments made by the residents.
307  1:30 pm

**Cultural interactions and integration: The influence of ethnic markets in suburban neighborhoods.**

Michael Cash, International Business (U)
Vinod Sasidharan, Hospitality and Tourism Management

Today’s university students will inevitably learn about transnational environmental protection combined with the benefits of being green. Additionally, they will understand the importance of corporate social responsibility and global citizenship. What is typically missing from curricula, however, is the local aspect—community sustainability. Most consumers will make purchases at stores that they are familiar with, often favoring domestic products, but this trend leads to higher levels of ethnocentrism and less appreciation of other societies (Schnettler et al., 2011). Expanding on the idea that inter-group personal contact is conducive to favorable opinions about immigrants and immigration, this study demonstrates that when residents begin shopping at ethnic markets in their neighborhood, acceptance of the experienced cultures improves and increases the viability of a cohesive and perpetuating citizenry (O’Neil and Tienda, 2010). Individuals aged 18 to 35 were asked to complete a packet containing the following: disclaimer information; guidelines on navigating two preselected grocery stores and suggestions on ways to interact with the staff; and two brief survey forms. The first survey included questions on previous encounters with ethnic markets and initial reactions to their shopping experiences. For the second survey, after a two week period, participants were asked to evaluate their awareness and appreciation of the cultures they had encountered in the first survey. Preliminary survey results show that upon initial contact with two separate markets—of two separate ethnicities—approximately 20% of participants reported a significant increase in cultural awareness. These findings indicate that greater community sustainability and integration can be achieved by enticing consumers out of their habitually visited markets and into ones that are more diverse. Through altering shopping habits, students can utilize local resources to augment their formal education thus preparing them for the global economy.

308  1:45 pm

**Sustainable Development and Residents’ Satisfaction Levels with the Quality of Life: A comparison between Ecuador and The United States**

Amanda Cosolito, Interior Design (U)
Vinod Sasidharan, Hospitality and Tourism Management

The purpose of this study is to obtain a better understanding of how to implement sustainable design solutions that improve the quality of life for residents. This primary research involves a bi-national comparison of community member perspectives and factors of sustainable practices implemented in their community to evaluate effective design solutions that improve quality of life. This study takes into account challenges and opportunities presented to community members that effect the satisfaction levels with sustainable development and its effect in their community and on individual lifestyles. Furthermore, this study attempts to find possible solutions that enhance the human experience and well-being. A comparative study among two specific countries to understand different implementation methods of sustainable development practices and the impact it has on the quality of life of the local residents is yet to be examined. The main goal of this research is to discover alternative solutions to address community needs. By examining two different countries, Ecuador and The United States, similarities and differences can be evaluated and shared to better understand effective implementation methods that increase community empowerment and sustainable development. This study analyzes community member perspectives regarding six factors: conservation, education, community involvement, infrastructure, energy systems, water and land use. These factors impact sustainable developments world-wide and can be used as a foundation to evaluate impacts to perceptions on quality of life. The data collected is from forty local residents from various communities in both Ecuador and Southern California. Participants were asked to assert agreement levels to a series of statements that address these specific factors to measure their perception and satisfaction levels. Analysis of their responses will provide alternative solutions improving resident’s quality of life while considering the psycho-sociological phenomenon in physical design. Presentation of results will include quantitative data analysis of completed surveys and supporting photographs to enhance further understandings of successful sustainable design implementation methods. The expected findings can act as a framework to help accommodate future research applied to international and multi-regional environments that address the needs of community members throughout a variety of settings.

309  2:00 pm

**Encouraging Community Sustainability: Creating the Second Person Effect to Influence Social Responsibility through Emotional Appeals in Film**

Fernando Beltran, Journalism and Media Studies (U)
Vinod Sasidharan, Hospitality and Tourism Management

Research in second person effect argues that audience members who believe that they are equally influenced by media when compared to others in their community can be persuaded to resolve a social issue (Fredrick & Neuwirth, 2008). However, there is a lacuna of research that examines the rhetorical appeal to emotions (pathos) in public service announcements (PSA) in order to encourage participation in community sustainability efforts. The purpose of this study is to test if an appeal to pathos
in a PSA can generate the second person effect and audience to participate in a community cleanup event. Participants for the test were recruited from Eastlake, a Southern Californian community located in the city of Chula Vista. Participants completed an online survey consisting of a pre-test, a short video, and a post-test to evaluate the effectiveness of the video’s emotional appeal and perceived media influence on themselves and on other members of their community. This study will provide a better understanding regarding the production influential media content for PSAs about by using rhetorical appeals to generate second person effect in community sustainability efforts. Forthcoming research on this subject may define how rhetorical appeals in media content invoke the second person effect.

Session C-7
Oral Presentation: Health, Food, and Eating
Friday, March 8, 2013, 1:00 pm
Location: Library Addition 76

310  1:00 pm

What is holistic health? Perspectives from Alternative School Parents
Samuel Spevack, Anthropology (U)
Elisa Sobo, Anthropology

Recent debate between critical medical anthropologists (CMA) and naturopathic medical (NM) practitioners reveals a lack of agreement about what holism means in relation to health. Critical medical anthropologists locate the holistic nature of health in its sociopolitical and economic patterning, or its existence as part of a broader extra-individual system. Naturopathy anchors its definition of holism in the connection between an individual’s mind, body, and spirit, with health representing the holistic expression of the interrelation of these three domains. The CMA-NM conversation about what holism constitutes remains unresolved. One reason for the stalemate may be because each party in the debate views health from a narrowly delimited professional position rather than from the purview of a health seeking human being, who by definition occupies the crossroad between mind-body-spirit and political economic experiences and concerns. To illustrate how this may be, we describe findings from the Healthy Child Development Project, which asked parents who belong to an alternative school community well-known for championing health holism about their health-related knowledge and practices. We describe how these parents perceive and use holistic health as a means to acquire personal agency and address social and political-economic forces as well as to treat and prevent ailments involving both mind and spirit in addition to body. By identifying and understanding how parents are practicing holistic health with their families and as members of their school community, we can begin to formulate a more realistic and patient-centered definition of holistic health than that offered by narrowly focused professionals.

311  1:15 pm

The Relationship between Body Image and Disordered Eating in College Students Studying Foods and Nutrition
Carly Schott, Foods and Nutrition (U)
Tracy Daly, Student Health Services

Several studies have shown that college students studying foods and nutrition are at an increased risk of exhibiting disordered eating behaviors compared to students majoring in other disciplines. One university where this may be a problem is San Diego State University (SDSU), where 352 students major or pre-major in the popular field of foods and nutrition. Since college students studying foods and nutrition have an increased risk of developing disordered eating behaviors, educational and counseling services need to be easily accessible to this population in order to prevent health problems caused by these behaviors, especially since many will eventually be counseling others professionally about similar issues. The purpose of this study is to determine the relationship between body image and disordered eating behaviors among college students studying foods and nutrition in order to improve treatment options for these students. Participants will be 100 male and female college students studying foods and nutrition at SDSU. Each participant will complete the Eating Attitudes Test (EAT-26) questionnaire, a brief demographic questionnaire, and the Stunkard Body Image Assessment questionnaire in order to assess body image and eating habits. Results will be analyzed to determine the relationship between body image and disordered eating among college students studying foods and nutrition. It has been hypothesized that the presence of negative body image in this population will be associated with an increased risk of developing disordered eating behaviors. The determination of this relationship could improve existing treatment procedures for disordered eating and/or negative body image for college students studying foods and nutrition.

312  1:30 pm

Narratives That Integrate: Communicating Philosophies, Practices, and Identities in 21st Century Medicine
Brielle Plump, Communication (M)
Patricia Geist-Martin, Communication

The implementation of the Affordable Care Act in the United States will impact not only access to health care, but the availability of medical treatments and physician’s within certain areas of high demand related to Chronic Illness. Physician’s who
are used to running their practices like individual businesses will need to adapt to more team oriented medical structures. Moreover, the changing demographics of the United States will further influence the dynamics of patient access, medical team collaboration, and practitioner communication. Considering these elements, this ethnographic study questions how physicians do and plan to use their specific narratives of medical care philosophy to consult with patients and colleagues. Over fifty hours of data was collected via interviews, observation, and class attendance at a local integrative medical facility. Results indicate that narrative has three major functions in modern day medicine, (1) to advocate for lifestyle change as a key method for health interventions (2) to illustrate successes of evidence based medicine (3) to share concern/vision for the emerging era of health care. The results of this study will be instrumental for my continued research aimed at addressing the recent changes on Medical School Admissions (MR5) as well as health care practices within marginalized communities.

Key words: Integrative medicine, narrative, health communication

313 1:45 pm

Environmental Justice and Alternative Food Movements – Complicating the discourse about consumerism.

Kari Szakal, Women’s Studies (M)
Sara Giordano, Women’s Studies

Several feminist scholars have acknowledged how alternative food and environmental justice movements might be raced, classed, and gendered in a particular way. In using an “education first” strategy, some alternative food movements attempt to justify consumer non-involvement as indifference or bad consumption ideology, a phenomenon that assigns blame to women first. Since women are often responsible for providing the meals for their families, non-compliance with the goals of these movements may have the appearance of irresponsibility or bad parenting and highlights personal responsibility rather than the social or political circumstances that created these issues. In response to these limitations, some grassroots environmental justice movements have sought to include those traditionally left out and have used a variety of anti-racist, anti-sexist strategies to appeal to a different set of people than some more traditional organizations.

Both Rachel Slocum and Julie Guthman suggest that some organizations themselves might be limiting in their appeal to people because of their basis in white cultural food and consumption practices and assumption of middle class status. The physical manifestations of these movements (like CSAs, community gardens, and farmer’s markets) may also be exclusionary either implicitly, through their inability to accept certain forms of payment, or explicitly through their physical location and hours. Using a comparative analysis of the historical basis of environmental justice and alternative food movements,

I am able to think critically about the different marketing and organizing strategies of these groups and also cite where they may have engaged in practices that are non-inclusive or aimed at specific populations. This research is important because identifying the targeted populations of these movements and the strategies used to identify “good” or “bad” consumers is an essential part of complicating the alternative food movement discourse.

Session C-8

Oral Presentation: Education and Identity
Friday, March 8, 2013, 1:00 pm
Location: Library Addition 78

314 1:00 pm

The combination of collaborative play therapy, solution-focused art therapy, and narrative art therapy improves academic performance and in-school and at-home behavior of elementary school children

Ralf Schuster, Psychology (U)
Brent Taylor, Counseling and School Psychology

This study was a quantitative investigation of whether the combination of collaborative play therapy, solution-focused art therapy, and narrative art therapy would improve the academic performance and decrease the conduct-behavioral problems of selected elementary school students in the Southwest United States; about two thirds of whom were of Latino background. Unlike therapies that focus on deficiencies, these three therapies recognize strengths as the basis for therapeutic intervention from a multicultural perspective. Collaborative play therapy, solution-focused art therapy, and narrative art therapy allow children to explore and express feelings that they may find difficult to express in words. Behavioral interventions are generally more successful in children if they can build collaborative and therapeutic relationships with a therapist and participating peers. Fifty-seven elementary school children, 33 boys (age in years: range 5.5 - 9.7, $M = 8.0$, $SD = 1.5$) and 24 girls (age in years: range 5.6 - 9.6, $M = 7.7$, $SD = 1.2$), in grade levels 1 through 5, were recommended by administrators, school psychologists, or teachers in three elementary schools in a neighborhood of lower socioeconomic status, and by their parents to participate in the therapy program. These children had academic difficulties and conduct-behavioral problems, two primary factors that could lead to a later diagnosis of “at-risk youth”. A series of longitudinal, simultaneous therapeutic interventions, through a combination of the three therapies, was administered by second-year marriage and family therapy graduate students in several individual, family, and peer group sessions that were conducted in English and Spanish at school and at
home over one academic year. The behavior was quantitatively assessed at the beginning and the end of the intervention through the Eyberg Child Behavior Inventory (ECBI), which is designed for completion by parents, and the Sutter-Eyberg Student Behavior Inventory-Revised (SESBRI-R), which was developed for the assessment of disruptive behaviors that typically occur in school. The Common Constraints Form, a study-specific questionnaire, quantitatively assessed the most common behavioral problems. Paired and independent-samples t-tests revealed that the children’s academic grades improved in English (t (56) = 4.63, p < .001) and mathematics (t (56) = 1.95, p = .056), the behavior improved in girls from the perspective of their parents (t(13) = 2.20, p = .047), and the teachers rated the children better at finishing tasks or projects (t (14.49) = 2.06, p = .041).

It can be concluded that the combined intervention of collaborative play therapy, solution-focused art therapy, and narrative art therapy was effective in some but not all areas of academic or behavioral difficulties. Behavioral changes appear to be gender- and location-specific, because the intervention did not lead to improvement of science grades and only produced one behavior-changing effect in both genders from the teachers’ perspective.

Keywords: strength-based therapy, collaborative play therapy, solution-focused art therapy, narrative art therapy, therapy effectiveness, marriage and family therapy, at-risk behavior

315 1:15 pm

The effectiveness of a skill-building curriculum, Families OverComing Under Stress (FOCUS), with school-age children from military families in San Diego

Susana Flores, School Psychology (M)
Tonika Green, Counseling and School Psychology

Since the beginning of Operation Enduring Freedom and Operation Iraqi Freedom, an increasing number of military children have been faced with wartime deployment stressors and challenges including repeated relocation, parental absence, and related fears and concerns (Saltzman, Lester, Beardslee, Layne, Woodward, & Nash, 2011). The need for public school supports is amplified by research, which shows that resulting stress, and mental health issues negatively influence the academic, social-emotional and psychological outcomes of military connected students (Angrist & Johnson, 2000). Schools that support military connected students can improve their availability for learning and overall academic performance. Recent studies have shown that supportive school environments can potentially serve as a protective factor that shields students from depression, conduct problems, feelings of alienation, anxiety, and school failure (Atuel, Esqueda, and Jacobson, 2011). The current study quantitatively and qualitatively evaluates the effectiveness of a counseling curriculum, Families OverComing Under Stress (FOCUS), created by the UCLA School of Neuroscience and Harvard School of Medicine, in teaching resiliency skills. The curriculum has been shown to be effective in military bases and aims to involve the family as a whole. However, in response to the lack of research on the use of FOCUS in schools, two School Psychology Trainees used a student-centered version of the curriculum in order to see if the proven benefits could be extrapolated to the school setting. The study involves two groups of fourth and fifth graders (n=9). Skills that were taught include emotional regulation, communication, goal-setting, deployment reminders, and problem solving. Students participated in a total of nine sessions, which ranged from 30-60 minutes. Data was collected by administering pre and post surveys to the students, which consisted of scaled questions to measure learning throughout the groups. In addition, qualitative data was gathered throughout the intervention, and students were asked how they apply the skills taught in their lives and their overall impressions of the group. Overall, students demonstrated positive outcomes, and 8 out 9 students would recommend participating in a FOCUS skill-building group to other military connected students. Further results will be discussed in addition to limitations and future directions.

316 1:30 pm

Bilingualism and Teaching Practices

Soujanya Gade, Child & Family Development (M)
Sarah Garrity, Child and Family Development

This study is designed to gain a deeper understanding of early childhood education from research to application through the lens of teacher practices. Four Head Start teachers will be observed and videotaped in their interactions with children and participate in bi-monthly meetings on reflective practice. Keeping in mind the various teaching practices observed by the teachers, early language acquisition in bilingual children will be noted.

317 1:45 pm

Applying Social Orientation Theory in the Communicative ESOL Classroom

Amanda Opperman, Education (D)
Valerie Pang, Teacher Education

Cultural psychologists have found trends of thinking in different societies, with some cultures demonstrating a more analytic arrangement and others a more holistic arrangement. In tandem with displaying a tendency towards an analytic or holistic cognitive arrangement, these cultures also display tendencies towards either an independent or interdependent social orientation. Cultures that reflect an independent social orientation tend to emphasize self-direction, autonomy, and self-expression. This often results in student-centered, Socratic learning environments. On the other hand, cultures that reflect an interdependent social orientation tend to emphasize...
harmony, relatedness, and connection. This results in classroom environments in which the students act as a mass consenting group that bends to the will of the master teacher. Independently-oriented cultures tend to view the self as detached from social others, whereas interdependently-oriented cultures tend to view the self as unified with social others. In independently-oriented cultural contexts, each student has his or her own agency and self-determination, while in interdependently-oriented cultural contexts, each student exists to cooperate, obey, and join in the fold. A large body of research has demonstrated that cultures which differ in social orientation also show corresponding differences in cognitive style; Western societies tend to exhibit the independent, analytic cognitive arrangement, while East Asian societies tend to exhibit the interdependent, holistic cognitive arrangement. These reported differences in cognitive arrangements contribute to the body of research concerning the effects of culture on learning style preferences. The central claim of this presentation is that these differences in cognition are grounds for the Communicative ESOL teacher to customize scaffolding techniques to the culture of her students. The central argument is this: if culture directly informs social orientation and social orientation is a key factor in cognitive preference, then some forms of scaffolding are more effective and appropriate than others for any given cultural group. The research presented in this presentation can enhance and strengthen Communicative teacher education programs across the United States and abroad.

Session C-9
Oral Presentation:
Analytical and Physical Chemistry
Friday, March 8, 2013, 1:00 pm
Location: Love Library 406

318 1:00 pm
Controlled Derivitization of PDMS for use in Electrochromatographic Separations

Dylan Mitchell, Biochemistry (U)
Christopher Harrison, Chemistry

PDMS microfluidic devices have attracted much attention in the lab-on-a-chip field due to their low cost and ease of fabrication. However, difficulty lies in using PDMS as a platform by which to do electrokinetic separations, as the lack of a surface charge inhibits the development of a significant electroosmotic flow (EOF). This inherent obstacle is compounded by the difficulty of forming a channel in which to perform separation of analytes. Here we will discuss a cost effective method by which to permanently incorporate a charge into the native PDMS, and its application in electrochromatographic separations.

The use of paper as a stationary phase for electrokinetic separations has shown much promise due to the low materials cost, making it an attractive alternative to traditional lab-on-a-chip systems. Paper can be easily encased in PDMS through a simple process, which still allows it to retain its integrity as a viable channel through which aqueous solutions can pass. Cellulose has the ability to be derivitized through use of buffers and other reagents, allowing the paper to supplement in the generation of an EOF while acting as a chromatographic stationary phase. Though the fabrication of our paper-PDMS devices is simple, the process prohibits the use of traditional means of oxidizing/activating the PDMS surface. However, we have developed a method to exploit the hydrosilylation reaction that occurs normally during PDMS curing, giving us extensive control over the PDMS surface chemistry within the channel. Our fabrication process allows us to incorporate compounds that are reactive towards the native silicon hydrides (Si-H) present in PDMS pre-polymer and this way we are able to covalently derivatize the siloxane surface that is in contact with the paper. This process is being explored for its ability to generate and modulate the EOF, while also preventing non-specific adsorption of proteins.

319 1:15 pm
Application to Organic Synthesis: Simple Regioselectivity Determination in Hydroboration of 9-BBN

Brittany Barfield, Chemistry (U)
Thomas Cole, Chemistry

Borabicyclo[3.3.1]nonane (9-BBN) is one of the most important organoborane reagents in organic synthesis. The regiopurity of the hydroboration reaction is critical for a successful synthesis and is dependent on both the alkene and 9-BBN hydroborating reagent. While regioselectivity is well established for simple alkenes, hydroboration of functionalized alkenes with 9-BBN have generally not been determined. This is attributed to the effort required to determine the regioselectivity and the diverse nature and number of functionalized alkenes available. As a result, this has hindered the application of 9-BBN and other organoboranes for synthesis of organic compounds. We have developed a simple and fast method to determine the regioselectivities of these organoborane hydroboration reactions. In the present study, we have investigated the effects of coordinating ligands when complexed to the boron nuclei of 9-BBN. This coordination can be observed in the $^{11}B$ NMR spectrum, quantifying the regioselectivity. The $^{11}B$ NMR spectrum after hydroboration but before addition of the complexing ligand, is seen as a single peak. The ligand complexes to the different hydroborating products, shifting their resonance signals upfield and separating them into the two regioisomers, based on steric and electronic effects.
Integration of the two areas directly gives the hydroboration regioselectivity. This method is easier and faster than the classical method of oxidizing the organoborane products then separating and quantifying the formed alcohols products using gas chromatography. We have examined a number of functionalized alkenes for their regioselectivity in the hydroboration with 9-BBN. This includes those alkenes that have previously been determined as well as alkenes yet to be determined, validating this method to expand the scope of organoboranes that can be prepared with known regioselectivities for use in synthetic methodologies.

320 1:30 pm
Observation of Stimulated Emission Near 5μm in a Liquid Nitrogen-Cooled Plasma
Michael Baude, Chemical Physics (U)
Andrew Cooksy, Chemistry

Gas Discharge cells have been used extensively in the study of molecular dynamics. Typically, such cells are configured to accommodate long optical paths for increased sensitivity in detecting reactive chemical intermediates. While this configuration has been used extensively in emission and absorption spectroscopy, few emission transitions have been observed in the mid-IR. Here we report the observation of stimulated emission transitions in such a discharge cell, at wavelengths near 5μm. The transitions are observed under a liquid nitrogen-cooled discharge at approximately 100mA, using 500mtorr of He as a carrier gas. Using a tunable diode laser light source and phase-sensitive detection, stimulated emission transitions are observed by their mirror symmetry with absorption transitions. To date, we have observed over 20 distinct transitions. These transitions are tentatively assigned to Ozone, though more data is needed to definitively confirm this assignment. Stimulated emission from a gas medium near 5μm provides spectral line widths that are unobtainable in solid state laser systems and subsequently may provide a method for laser-based frequency calibration in the mid-IR. These observations may also contribute to our understanding of energy transfer processes involving Ozone in atmospheric and combustion chemistry.

321 1:45 pm
The Mechanisms of Hydrogen Bonding and Proton-Coupled Electron Transfer of Substituted N-(4-(dimethylamino)phenyl)-N-phenylureas in Different Non-Aqueous Solvent/Supporting Electrolyte Environments
Laurie Clare, Chemistry (M)
Diane Smith, Chemistry

Supramolecular constructs with redox centers can be used to build molecular devices or systems for chemical recognition. The construction of these supramolecular complexes involves self assembly with electrostatic forces such as hydrogen bonding rather than covalent bonds. Formation of the type of highly ordered structures used for molecular recognition relies mainly on multiple binding sites. Our studies focus on a urea scaffold that has been substituted with p-dimethylamino aniline to form a redox center, offering not only multiple hydrogen bonding sites within the urea N-H’s but an electrochemical mechanism that may be used for selective binding-unbinding or for anion recognition. Since electrochemical experiments are carried out in a solvent system, our early investigations include the effect of different solvent systems on three urea derivatives and their electrochemistry. The first urea derivative, U(Me)Me, cannot hydrogen bond as both N-H’s are substituted with CH₃. The second derivative, U(Me)H, contains one methyl substitution leaving the lone N-H on the redox center, and the third derivative, U(H)H, contains no methyl substitution, so both N-H’s are available for H-bonding.

Our original hypothesis was that cyclic voltammetry scans for U(Me)Me as well as U(Me)H and U(H)H would show two reversible oxidation waves indicating two separate and reversible one electron transfers, but this only occurred for U(Me)Me. For both U(Me)H and U(H)H the first oxidation wave had a smaller reduction peak followed by either a nonexistent or an irreversible second oxidation wave. The return scan showed a second reduction wave requiring a more negative reducing potential than expected.

Our revised hypothesis, based on voltammetry scans of U(H)H with dimethylaniline additions, is that the first oxidation wave for both U(Me)H and U(H)H has the height for a one electron wave, but not one electron from each urea. The first oxidation wave corresponds to the formation of a hydrogen bonded radical cation immediately followed by a proton/electron transfer. The extent to which either hydrogen bonding or proton transfer occurs depends on the solvent system and the amount of water in the system. This presentation will discuss CV scans, UV-vis spectra and computer simulations that support our revised hypothesis.

322 2:00 pm
Electroosmotic flow studies of onium based compounds by using capillary rinses and altering buffering ions
Ashley Morris, Chemistry (M)
Christopher Harrision, Chemistry

An important aspect in capillary electrophoresis is the ability to maintain a stabilized electroosmotic flow (EOF) during separations; an unstable EOF can lead to inconsistencies and irreproducible results. EOF instability can be exacerbated by the adsorption of analytes onto the silica surface during a separation. Some approaches to reduce the effects of adsorption and improve EOF control include the use of permanent and dynamic coatings. Permanent coatings can be achieved through the use of chemical modifications directly on the silica surface however; reaction
One such Lewis base, phosphoric acid, has been used to create ible bonds and making it well suited for cation exchange systems. It has strong interactions with Lewis bases, forming almost irrevers shown that because of its strong Lewis acid character, zirconia exchange and reverse phase chromatography. It has also been this ability, zirconia columns have become more common in ion umns, degrade at high temperatures and high pHs. Because of the traditional silica based columns that, unlike zirconia col

mixtures of compounds. Zirconia based columns have become a chromatographic technique used to separate, quantify, and identify High-performance liquid chromatography, HPLC, is a chro

Christopher Harrison, Chemistry
Stephanie Archibald, Chemistry (M)

The characterization of phosphorous acid as a coating for stabilization.

To fully understand the absorption and regeneration of buffer additives on the surface of the capillary, we studied the effect of using small-symmetrical quaternary ammonium and phosphonium compounds. Specifically, tetramethylammonium, tetramethylphosphonium, tetrabutylammonium, and tetrabutylphosphonium were examined. During EOF stability testing of the onium compounds, unanticipated changes in the EOF were observed over the course of 60 separations. To better understand the causes of the altered EOF and disruption of onium adsorption onto the silica surface; a variety of solutions and buffering ions were tested as capillary rinses and as the separation buffers to observe any potential influence on the EOF. Specifically, the capillary rinses included the use of methanol, sodium hydroxide, and combination rinses and anionic, cationic, and zwitterionic buffering ions were examined. Our observations have revealed how the EOF can fluctuate with the addition of different rinsing solutions and buffering ions. Fully understanding the observed interactive behavior of the additives on the surface of the capillary can lend insight into the chemistry occurring on the surface of the capillary and the properties affecting EOF stabilization.

323 2:15 pm

The characterization of phosphorous acid as a coating for zirconia columns in HPLC

Stephanie Archibald, Chemistry (M)
Christopher Harrison, Chemistry

High-performance liquid chromatography, HPLC, is a chromatographic technique used to separate, quantify, and identify mixtures of compounds. Zirconia based columns have become more popular due to their chemical and thermal stabilities, unlike the traditional silica based columns that, unlike zirconia columns, degrade at high temperatures and high pHs. Because of this ability, zirconia columns have become more common in ion exchange and reverse phase chromatography. It has also been shown that because of its strong Lewis acid character, zirconia has strong interactions with Lewis bases, forming almost irreversible bonds and making it well suited for cation exchange systems. One such Lewis base, phosphoric acid, has been used to create cation exchange sites on the surface of the column. In light of this interaction, another Lewis base, phosphorous acid, has been tested as a stationary phase on zirconia columns and compared to the phosphoric acid as a stationary phase.

The difference in the structures of the phosphate acids results in significantly different selectivities for the two stationary phases when separating moderately hydrophobic cations. We hypothesize that the P-H bond on the phosphorous acid allows for hydrophobic interactions, which are not seen with the phosphoric acid coating. This hydrophobic interaction is in addition to the ionic interactions, which results in a mixed-mode coating. This work continues the testing of both coatings to better characterize and understand the selectivity that each stationary phase offers.

324 2:30 pm

Relocalization Dynamics of the HC₃O Free Radical by Finite Element Method Vibrational Analysis

Peter Zajac, Computational Chemistry (D)
Andrew Cooksy, Chemistry

The ab initio potential energy surface of HC₃O carbon chain free radical ground state X2A’ was calculated using the CCSD-F12a/cc-pVDZ-F12 level of theory along the three selected vibrational coordinates: C_a-C_b-C_c relative distance, HC_a-C_b and C_b-C_c-O angles. Structural parameters for the two favorable nonequivalent canonical structures: propynonyl (acetylenic) and propadienonyl (cumulenic) were determined at CCSD(T)-F12a/cc-pVTZ-F12 level. The propynonyl structure, which was found to be energetically more stable, has the following equilibrium geometry: r(HC_a) = 1.0642 Å, r(C_a-C_b) = 1.501 Å, r(C_b-C_c) = 1.412 Å, r(C_b-C_O) = 1.183 Å, θ(HCC) = 176.4 deg, θ(CCC) = 166.9 deg, θ(CCO) = 135.4 deg. The stabilization energy for propan-dienonyl is predicted to lie 776.572 cm−1 higher than the propynonyl with a barrier to isomerization of only 79.6 cm−1. The 50 lowest vibrational eigenvalues are solved on this flat and anharmonic surface using the finite element method [Comp. Phys. Commun., 180, 2079-2094 (2009)] along with the reconstructed wave functions for the 20 lowest vibrational states.
325  1:00 pm
**Addressing Confounding Occurrence of Errors With the Dylos Air Quality Monitor**
Calvin Wong, Public Health (U)
Zohir Chowdhury, Graduate School of Public Health

Objective: This study was designed to accomplish the following: find any possible error in the validity of results taken by the Dylos, address confounding variables found in the environment or systematic error within the machines, identify methods to reduce and prevent possible error in data collection. Methods: **edit**

Using multiple Dyluses and placing them in various settings and environments in order to detect any change between the environment and machines. PM from dirt, water vapor, burning paper, and burning cigarettes will be measured by the Dyluses and their results will be compared to one another. Results: (sounds like interpretation) There was error in vertical and horizontal gradient, systematic error between the machines, cleaning error that arose from long term use, and proximity with emitting sources of PM.

Conclusion: In order to prevent error in vertical and horizontal gradient, the Dyluses must be placed as close as possible to each other. The systematic error was corrected by using an equation that adjusted the raw data to a more reliable data. In addition, the Dylos must be kept clean by blowing air into the collecting fan, located on the back of the machine, in order to prevent particulate matter (PM) from building up and resulting in error. The Dylos must be placed far enough from the source of pollution for the PM to diffuse into the environment but not too close where the instrument would be collecting a concentrated sample.

326  1:15 pm
**Mapping and Monitoring: The Water Distribution System in Balboa Park**
John Moran, Environmental Sciences (U)
Matt Rahn, Environmental Sciences

Balboa Park’s water distribution system is old and prone to leaks and breaks. Untreated, the pipes in the park could be slowly leaking water without the knowledge of the staff. These leaks can undermine roads and structures while wasting the Park’s water and taxpayers’ money. Additionally, an unnoticed break in a pipe could cost the park millions of dollars in unnecessary damage to historic building and sensitive environments. In the case of a major disaster, many breaks can occur in countless locations. By incorporating volumetric flow rate sensors to key areas in the system, we will be able to detect large breaks in the system immediately. Additionally, moisture gauges on the outside of the pipe will allow for the recognition of slow leaks while allowing for the automatic adjustment of watering cycles to suit area proximal to the sensor. With the sensors in place and a GIS map of the valves and pipes, Balboa Park will be able to manage its water use more efficiently, saving the taxpayers’ money and the community water. Additionally, The Park would be more prepared in the event of a break or major natural disaster. With the saving in money, the system should pay for itself over time.

327  1:30 pm
**Methods and Data: Trace Gas and Water Vapor Sampling**
Jared Marsh, Environmental Sciences (U)
Matt Rahn, Environmental Sciences

Water vapor and carbon dioxide are the primary gases that control both long and short term climate fluctuation on earth. Anthropogenic activities continue to increase the atmospheric concentrations of CO$_2$ and other greenhouse gases (GHG’s) such as methane, carbon monoxide, etc. Due to this anthropogenic increase, these GHG’s effects on water vapor must be precisely understood. Obtaining GHG data is critical if accurate long and short-term climate modeling is to be obtained. With this objective in mind, this paper delves into what instrumentation and methodology is necessary for accurate ground level gas sampling. The air sampling is done in partnership with University of California Irvine via James Randerson, and the University of Utah via James Ehleringer, in order to sample, monitor, and hypothesize these complex and fundamentally important interactions.

328  1:45 pm
**Recycled Groundwater Development at Harmony Grove, San Diego County, CA**
Cheryl Johnson, Geological Sciences (M)
Kathryn Thorbjarnarson, Geological Sciences

The Harmony Grove Valley, located in an unincorporated area of northern San Diego County, California, is being considered as a location for underground storage, extraction, and re-use of treated, recycled water. Treated recycled water would be pumped, or allowed to infiltrate into the high point of this small fractured bedrock groundwater basin, and extracted at a lower point. A screening-level groundwater model was developed using MODFLOW and Groundwater Vistas to assess the amount of water that can be stored and extracted annually, and the residency time of the recycled water underground. The model was based on researched aquifer parameters, including those from local weathered hard rock aquifers, site specific well logs to characterize the subsurface, and was calibrated against
hydraulic head data from wells in the study area. Subsurface geology was generalized for the model as a 100 foot thick layer of regolith overlying unweathered fractured bedrock. Four injection wells and four extraction wells were modeled at distances ranging between 5,000 and 7,500 feet apart for the near and far wells, and the flow rates and durations were varied to obtain the maximum amount of flow without flooding injection wells or drying out pumping wells. Injection and pumping wells were screened only through the regolith, such that the flow of the injected and extracted water is assumed to occur within this connected media rather than the fractured bedrock, which is less predictable in terms of travel time. Modeled maximum injection and pumping volumes generated less than 500 acre-feet per year, which may even be an overestimate based on pumping rates sustained on site. A sensitivity analysis was also conducted, which showed that the groundwater model was sensitive to changes in hydraulic conductivity and specific yield. Retention time calculations are also sensitive to porosity. Retention time was modeled using MODPATH. Although calculated recycled groundwater retention times are not prohibitive, the low estimated annual yield of less than 500 acre-feet may make such a project economically ineffective at this location.

329 2:00 pm

*The influence of ammonium and Suwannee River humic acid on the dissolution and toxicity of silver nanoparticles to Nitrosomonas europaean*  
Cameron Kostigen Mumper, Environmental Sciences (M)  
Tyler Radniecki, Civil, Construction, & Environmental Engineering

Silver nanoparticles (AgNPs) are the fastest growing market segment of nanomaterials. AgNPs are exploited for their antimicrobial properties and are incorporated into a wide variety of commercially available products, including clothing, wound dressings, food storage containers, and washing machines. The increased production of AgNPs has raised concerns regarding their potential impacts to the stability of wastewater treatment plants (WWTPs). This research investigated the influence of ammonium (NH$_4^+$), and Suwannee River humic acid (SRHA), common wastewater constituents, on the dissolution and toxicity of 20 nm citrate AgNPs to *Nitrosomonas europaean*, an ammonia oxidizing bacteria commonly found in WWTPs and responsible for the conversion of ammonia (NH$_3$) to nitrite (NO$_2^-$). The influence of NH$_4^+$, and SRHA on AgNP toxicity towards *N. europaean* was determined by monitoring their nitrification activity during 3-hour batch bioreactor experiments. Nitrification activity was defined as the linear average of NO$_2^-$ produced per mg of protein per minute. Nitrite production was measured colorimetrically every 45 minutes over the course of 3-hours. UV-vis spectrophotometry was used to investigate the influence of NH$_4^+$ and SRHA on the dissolution of the AgNPs. Batch bioreactors for dissolution studies were similar to those used in the toxicity experiments, with the exception that no cells were added. Samples were collected every 45 minutes over the 3-hour period and their absorption spectrum from 300 to 700 nm was measured.

The toxicity of the AgNPs increased with increasing NH$_4^+$ concentrations. The increase in toxicity is attributed to an increase in AgNP dissolution to silver ions (Ag$^+$.). The creation of silver-amine complexes (NH$_3^+$Ag$^+$ and (NH$_3$)$_2$Ag$^+$) is believed to be responsible for the increased rate of AgNP dissolution. The presence of SRHA decreased AgNP toxicity by adsorbing to the AgNP surface thus preventing dissolution to Ag$^+$. However, the effectiveness of SRHA at reducing AgNP toxicity decreases with increasing NH$_4^+$ concentrations. This suggests that even in the presence of organic matter (*e.g.* SRHA) that coats the AgNPs, increased concentrations of NH$_4^+$ will result in increased AgNP toxicity. Thus, AgNPs will be more toxic in highly eutrophic environments (*e.g.* WWTP) than in more pristine environments.

330 2:15 pm

*Sensitive Laser Spectroscopic Studies of Chemical and Biological Agents for Biomedical and Security Applications*

Marcel Hetu, Chemistry (D)  
William Tong, Chemistry

Nonlinear laser wave-mixing spectroscopy is presented as an ultrasensitive detection method for chemical and biological agents in thin-film, gas- and liquid-phase samples. Wave mixing is an unusually sensitive absorption-based detection method that offers inherent advantages including excellent sensitivity, small sample requirements, short optical path length, high spatial resolution, and excellent standoff detection capability. Wave mixing offers excellent optical absorption detection sensitivity even when using thin samples (<0.1 mm), and hence, it is inherently suitable for interfacing to microarrays, microfluidics, chip-based capillary electrophoresis and other liquid- and gas-phase flow systems. The wave-mixing signal is generated instantaneously as the two input laser beams intersect inside the analyte of interest. Wave-mixing detection can be used in both transmitted and reflected modes to detect chem/bio agents on surfaces. Laser excitation wavelengths can be tuned to detect multiple chem/bio agents in their native form. Since the wave-mixing signal is a coherent laser-like beam with its own propagation direction, it offers excellent S/N and allows remote standoff detection capability. The sensitivity of this laser detection technique has reached levels in the parts-per-quadrillion range. These sensitivity levels have been optimized for proteomic analyses on single cells. This early work has provided the framework for the proposed work involving analytes related to autoimmune and neurodegenerative diseases, more advanced high-throughput detection systems, and specific detection and identification of chem/bio agents using tunable mid-infrared quantum cascade lasers.
ABSTRACTS

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

Session C-12
Poster: Psychology and Public Health
Friday, March 8, 2013, 1:00 pm – 2:45 pm
Location: Library Dome

331 Poster #1 1:00 pm-2:45 pm
Challenges, stressors, and coping mechanisms in Mexican-American women
Joanna Sariñana, Psychology (U)
Linda Gallo, Psychology

Background: Compared to the rest of the U.S. population, Mexican-American women have an increased risk of developing health problems (e.g., obesity, diabetes, heart disease). Research suggests that stress plays a significant role in health outcomes. The current qualitative study seeks to provide an in-depth understanding of the challenges, stressors, and the coping mechanisms that Mexican-American women experience to inform future studies aimed at improving Latina health.

Methods: An exploratory, descriptive study consisting of eight key informant interviews facilitated by qualitatively trained bilingual project staff members was conducted. Participants were Latina, 18 years and older, and working or residing in the South Bay area. The interviews were tape-recorded, transcribed, and if necessary, translated for content analysis of common themes and patterns through qualitative methodology to address the aims of the study.

Results: In terms of personal stressors, participants most often mentioned experiencing multiple role conflict (e.g., gender roles, family demands), unfair treatment (e.g., sexism, stereotypes), and stress adjusting to the American lifestyle (family and communication barriers, employment barriers, language and system barriers). The coping mechanisms most cited by participants included having a positive outlook on life (e.g. acceptance and humor), social support (family and friends), social activities (e.g., dancing, festivities, and crafts), and faith (e.g., religion, spirituality, and personal relationship with God).

Conclusion: Findings reveal that there is a unique set of stressors that Mexican-American women experience including multiple role conflicts, unfair treatment, and adjustment to the American lifestyle. In response to these particular stressors, participants reported several coping mechanisms which consisted of having a positive outlook on life, social support, social activities, and faith. It is important for healthcare providers to be aware of the unique stressors that Mexican-American women face as these stressors may have a negative impact on their health. Although results suggest that family can be a source of stress, family also appears to serve as a resource and may be a protective factor against negative health outcomes for Mexican-American women.

332 Poster #2 1:00 pm-2:45 pm
The Influence of Gender, Age and Income on Children’s Chores
Lindsay McCampbell, Psychology (U)
Melbourne Hovell, Graduate School of Public Health/C-BEACH

Parent’s roles and attitudes have become increasingly egalitarian, yet children’s gender and age, as well as family income have been shown to influence parent’s expectations of children’s participation in household chores. Past research indicates children are given gender specific chores, with sharper gender specificity for older children, and that a lesser amount of chores are assigned in families with access to paid domestic help. The present study examines the extent to which society has adopted the modern egalitarian views of gender roles, by investigating the influence of child gender and age on the amount of chores assigned that are considered stereotypically feminine or masculine. Additionally, parents’ income is investigated in relation to the amount of chores assigned to children. Participating parents/legal guardians were recruited for an obesity and tobacco prevention program through their preteen or teen child’s orthodontist office. Participants reported demographics through a survey and were interviewed over the phone about chores assigned to their children. Parents/legal guardians of 350 children (Mage =12.17, SD=1.78) reported the chores they expected their children to accomplish. The children (54.6% female) mostly identified as Caucasian (74.3%). Simultaneous multiple regressions revealed that gender significantly predicted type of chore (indoor vs. outdoor), with girls assigned more indoor chores than boys (p<0.01) and boys assigned more outdoor chores (p<0.01) than girls. Additionally, age predicted the amount of chores assigned, with older children being assigned significantly more chores than younger children (indoor, p<0.05; outdoor, p<0.05), yet there was no interaction between gender and age. Income was not significantly related to the total amount of chores given to children, contrary to past research. Findings suggest that although both genders do more chores as they age, the type of chore assigned is just as gender specific for younger children as for older children. Low variance may explain the lack of significant findings for income; however, the outcome suggests that parents may be delegating chores based on factors other than financial ability to hire domestic help with chores.

333 Poster #3 1:00 pm-2:45 pm
How Parental Barriers to Accessing a Usual Source of Care Affect Children’s Preventive Health Service Use
John Bellettierie, Health Promotion and Behavioral Science (M)
Emmeline Chuang, Health Management and Policy

In 2009-2010, 20.3% of all adults and 26% of adults aged 18-44 reported not having a usual source of care (USC), a place they usually go when sick or in need of health advice. Having
a USC affects individuals’ likelihood of receiving screening and other preventive services as well as access to and utilization of needed medical care. Children, who depend on their parents to provide opportunities for health care use, are less likely to receive health care if at least one of their parents is without a USC. This study uses data from the 2011 National Health Interview Survey (NHIS), which is nationally representative of the non-institutionalized civilian population in the U.S., to determine how parental barriers to accessing a USC affect children’s receipt of preventive health services. Of the 9,058 parent-child pairs identified from the survey, our study sample included 1,658 pairs in which the parent reported not having a USC. Drawing on the Andersen-Aday behavioral model, self-reported barriers to accessing a USC were classified into 4 mutually exclusive groups: predisposing factors (beliefs and values about health care), enabling factors (financial and community resources available), other factors (unspecified), and multiple factors (combinations of the above). We also controlled for other factors known to affect service receipt such as child age, gender, race/ethnicity, health insurance status, and household income. Logistic regression models with adjustments for the complex survey design examined the association between these factors and children’s receipt of three preventive services (well-child care visit, flu vaccination, and outpatient visit) within the last 12 months. Compared to children whose parents reported enabling barriers to accessing a USC, children whose parents reported predisposing barriers were significantly less likely to receive a well-child care visit (adjusted odds ratio [aOR] 0.63; 95% confidence interval [CI], 0.45-0.88), flu vaccination (aOR 0.54; 95% CI, 0.35-0.83), and an outpatient visit (aOR 0.58; 95% CI, 0.43-0.78) within the past 12 months. These findings suggest that health education interventions designed to change parental health care beliefs may be as important as enabling factors such as insurance or transportation in improving children’s receipt of preventive services.

**334** Poster #4 1:00 pm-2:45 pm

*Family Perspectives of a Parent-Implemented Blended Intervention Approach for Young Children At-Risk for ASD*

Julia Trigeiro, Public Health (M)
Emmeline Chuang, Public Health

Early identification and intervention has been shown to improve the long-term prognosis of children with autism spectrum disorders (ASD). Recently there has been a strong push for identification and treatment of young children with ASD before age two. To extend therapy beyond a clinical setting, parent education programs have been established to emphasize a dual caregiver–therapist role, educate parents about evidence-based intervention strategies, developing parent-child reciprocal interaction and improve child social communication.

The BRIDGE Collaborative is an interdisciplinary team of researchers, community providers, funding agency representatives, and families of San Diego County. In 2010, the Collaborative conducted a pilot study to examine the feasibility of implementing an evidence-based parent education program (Teaching Social Communication) for young children (12-24 months) at-risk for ASD. This poster presents parent satisfaction data collected as part of that study. The intervention involved community therapists training parents over twelve weeks to implement naturalistic behavioral and developmental treatment-strategies with their child (15 families enrolled, 13 completed). Child cognitive and parent self-reported outcome measures were collected pre and post program enrollment. An additional 27-item open-ended exit interview captured parent satisfaction with the intervention as well as specific areas of benefit and concern. Parent responses to this interview were coded using a Likert scale (1-3) by two independent researchers (inter-rater reliability >89%).

Overall, parents reported a high rate of satisfaction with the intervention with a mean of 40 from a possible 45 total (range 34-44), with greater values indicating higher satisfaction. Themes identified from the qualitative included feelings of increased confidence with child-parent interactions, and critical feedback about supplementary reading material and assignments outside of the clinic. Results from this study will inform a larger-scale study of intervention effectiveness scheduled to begin in Spring 2013. This research was supported by NIMH Research Grant: U.S.P.H.S. Research Grant 1R21MH083893-01A1(AS)

**Session C-13**

**Poster: Urban and Environmental Research**

**Friday, March 8, 2013, 1:00 pm – 2:45 pm**

**Location: Library Dome**

**335** Poster #5 1:00 pm-2:45 pm

*Hacienda Escudero*

John Luu, Environmental Science (U)
Matt Rahn, Environmental Sciences

The Hacienda Escudero development project in the Philippines plans to push the boundaries of urban Filipino living by promoting a life style that is closely in sync with nature. Although the development project targets low impacts towards the environment while living comfortably, its source of energy is still the outdated and unreliable, fossil fuel consuming power grid. For this project, our goal is to determine how to integrate alternative energy sources for the Hacienda Escudero project to reduce and/or eliminate its reliance on the traditional power sources and also make the project a self-sustaining community. The Hacienda...
Escudero site has potential for solar, wind, water, and biomass alternative energy sources. However, research is still necessary to figure out if the power generated from these power sources can support the demands, as well as being affordable. If the project proves to be successful in finding alternative energies that can meet the demands as well as being affordable, the Hacienda Escudero project could inspire future developers on how communities should be built in the Philippines.

**336 Poster #6 1:00 pm-2:45 pm**

**Sustainable human development through affordable housing: A comparison of traditional vs. mixed income housing models**

Elena Shulman, Urban Studies (U)
Vinod Sasidharan, Hospitality and Tourism Management

With the traditional model of affordable housing evolving into more integrated and dense environments, understanding the needs of community residents is becoming a very important issue. Both public and private sector housing development entities are increasingly focusing their efforts toward locating affordable units within more middle-income communities. This phenomenon presents new sustainable development challenges that require in-depth investigation. Examining what makes a community strong, and what methods best support its residents, can help create environments that thrive and ultimately support sustainable human development. By utilizing primary data, this study compares traditional affordable housing and mixed income models, to determine community benefits and to better understand the needs of the residents, in relation to sustainable human development. This project will further the understanding of how affordable housing can contribute to sustainability and community vitality. Creating communities that allow individuals and families to live affordably can enhance sustainability, supporting community longevity and prosperity. This study examines the dimensions of public and private amenities within the affordable housing community, to better understand how the built environment can better serve the people, i.e., residents. With the need for affordable housing in great demand, existing programs are targeting significant issues that relate to sustainability. In addition to remedying demand, housing agencies are focusing on sustainability practices that address basic community needs. This study will contribute to the understanding of how affordable housing models can effectively support sustainable human development. Future research in this area can add by implementing cutting edge ideas and methods to further the theme of sustainability within affordable housing.

**337 Poster #7 1:00 pm-2:45 pm**

**Cultivating Communities: The Symbiotic Connection Between People and Urban Gardening**

Christian Zaragoza, Urban Studies/Environmental Studies (U)
Vinod Sasidharan, Hospitality and Tourism Management

As a result of mass urban sprawl, people in local urbanized communities face challenges to meet the standards of a healthy lifestyle—including their access to nutritious foods and ability to collectively make decisions within the community. In response to this, members of urban communities are increasingly organizing efforts to utilize open spaces and transform them into community gardens/farms. Community gardens have served as hubs for community and individual development. Aside from the holistic and therapeutic benefits of gardening, community gardens serve to empower the participants on and off site. While participating in a collective effort to make a change, members of the community have the opportunity to develop a voice for the people as well as increase their status as individuals and as a whole. Community farming has grown increasingly popular in urbanized areas across the Western United States in cities such as Seattle, Portland, and Long Beach. With the growing popularity of urban farms in San Diego—particularly in the southeastern portion—this study seeks to discover if community gardens increase the overall vitality of a community. To address this question, surveys were conducted at several different community garden sites in the San Diego Area. Those surveyed in this study included actual participants at the City Heights and Mt. Hope Community Gardens, and New Roots Community Farm ranging from growers and service volunteers, to community leaders and garden coordinators. This study explores dimensions associated with the vitality of a community including opportunity, agency, value, and nutritional health. The data collected from the study shows that 89% of garden members either agreed or strongly agreed that participation on the garden inspired them to engage in collective action with their peers. While, only 53% of the garden members felt that there was a strong sense of community in their area. By finding whether or not there is a connection between participation in community gardens and overall community vitality, urban planners can better decide whether it is valuable and beneficial to a community to incorporate gardens/farms into the planning process of a city or urban environment.
School gardens have significant potential to promote a deeper sense of community, encourage a healthier lifestyle and offer hands-on education, which is important for children's academic and personal development. This study investigated two models of school gardens and attempted to identify the variables contributing to their successes and failures, in an effort to understand how such programs can be implemented and effectively sustained in a school environment. Two schools – one without a garden, and one with, were studied. The subjects for the study were 30 children in Kindergarten from each of the two schools. Interviews were conducted individually using a two-part survey; visual charts for the first portion of the survey and open-answer questions for the second part of the survey. The study was designed to address children's ability to identify a variety of common fruits and vegetables, describe the source of these fruits and vegetables, provide opinions regarding fruits and vegetables, and explain their gardening preferences. Findings from this study showed that in an elementary school without a garden, 56% of the subjects interviewed could not correctly specify the source of fruits and vegetables. In most cases, the subject could not identify the fruit/vegetable by name when viewed in its raw form, but once they heard the proper name, would agree that they did like to eat the fruit/vegetable. 93% showed interest in growing food in a garden. By investigating the multiple school garden programs that exist throughout the East County of San Diego, CA, we discover the differences between the garden programs that are productive and the ones that have fallen short of staying operational. Findings from the study highlight the factors, relating to children’s attitudes and participation, which could contribute to sustaining the productivity of existing school gardens and support the implementation of new projects.

The Philippines is a rapid growing developing country exposed to extreme natural conditions such as typhoons, floods, torrential rains, earthquakes, and volcanic eruptions. To promote conservation under intense environmental degradation, new ecological strategies are being implemented to minimize the negative impact on people’s livelihood and the country’s rich biodiversity. In this investigation I will examine the literature related to Philippine ecological conservation strategies in attempt to evaluate the effectiveness of mitigation efforts. By synthesizing literature from different disciplines, I hope to identify strengths and weaknesses linked to conservation efforts, which could be used as a model for other developing countries.

The goal of this proposal is to fix one of many flaws in the California Environmental Quality Act. We will research and develop a key understanding of the process of writing environmental review documents and who is responsible for providing the documents. In many cases, the lead agency is allowed to appoint who can write the documents. However, we have found in many cases that these documents written by inside agencies are found to be biased and inaccurate to speed up the process of development, and in most cases, to approve the development project altogether. CEQA Guideline 15084 states that the lead agency has the right to choose who writes the environmental documents, ranging from personal firm to contracting a separate entity. By amending the Guideline 15084 at the California state level, we would propose that only third party, private or public, entities, firms or environmental consulting agencies are allowed to write any environmental impact documents pertaining to the proposed project or development. By making this amendment, the possible positive implications we would create is ensuring that all documents are unbiased, accurate, written fairly, able to support the environment and the state of California, follow CEQA laws precisely and promote well being for our states environmental conditions.

Anxiety is one of the most widespread and emergent mental health issues that we are currently facing. Individuals with elevated trait anxiety tend to experience deficits in cognitive processing that may alter their overall performance. Highly anxious individuals were seen to have lower scores on visual
Multi-Dimensional Dehumanization of Mental Illnesses

Michael McGlenn, Psychology (U)
Melody Sadler, Psychology

Dehumanization in contemporary research is conceptualized as the lesser attribution of various mental capacities, but has yet to study mind attribution as it varies between different human social groups. Current research into mind attribution theorizes that there are two dimensions that can be dehumanized on: ‘experience’, which includes experiential capacities such as sensation and emotion, and ‘agency’, which includes executive capacities such as planning and self control. The current study measured the attribution of different mental capacities to various mental illnesses in an online survey. It was predicted that mind attribution towards different mental illnesses would vary by agency and experience, consistent with the two dimension theory.

Our results were not consistent with the two dimension theory. Rather than extracting the two dimensions of agency and experience, factor analysis found that participants dehumanized those with mental illnesses on three different dimensions – morality (e.g., self control and moral emotion), hedonia (e.g., desire and pleasure), and executive function (e.g., thought and memory). For example, persons with pedophilia scored lowest on perceived moral capacity, while those with insomnia scored highest. We propose the theoretical inconsistency is due to conflicting target group selection, in that previous research has studied targets that vary in their mental foundations (e.g., animals, humans, gods), whereas we investigated targets varying in deficits to a shared foundation. This theoretical inconsistency implies that mind attribution does not vary on universal dimensions of related capacities (i.e., agency and experience), but rather attribution of specific mental capacities can be independent of other capacities, and covariance of capacities is contingent upon target group selection. This research implies that more complex and targeted models of mind attribution are needed in order to explain variance in mental capacities afforded to different human social groups, especially those with mental illness.

The effects of anxiety and cognitive load on attention control

Kristen Frosio, Psychology (U)
Nader Amir, Psychology

Impairment in attention control abilities has been implicated in poor regulation of emotions such as anxiety. Using a performance-based task to assess attention control, the current study examined whether anxiety is associated with impaired attention control, and whether these effects are influenced by working memory load. Results showed that anxiety was associated with decreased attention control, but only under low cognitive load. Under high cognitive load, anxiety was associated with a narrowing of attention and hence decreased interference from distractors. Our findings help to clarify apparently contradictory predictions regarding the influence of anxiety on attention.

Exploring Ethnic Match, Acculturation Match, and Parental Agreement as Correlates of Parental Agreement with Therapists on Biopsychosocial Causes of Child Problems

Duyen Trang, Psychology (U)
May Yeh, Psychology

Due to the low participation of ethnic minority clients in mental health services, cognitive match, agreement or shared understanding between therapist and client, has been proposed as important in providing culturally competent services in mental health treatment. In this study, correlations were performed to analyze the relationships between three potential predictors of cognitive match (i.e. parent-therapist ethnic match, degree of parent-therapist match on acculturation to mainstream American culture, and parent acculturation to mainstream American culture) and parental biopsychosocial beliefs about the causes of child problems. Data were collected from Caucasian, African American, Native American/Alaska Native, Multiracial, Asian American/Pacific Islander, and Latino parents of youth receiving outpatient mental health services (n = 277) and associated therapists (n = 48). Parental agreement with therapists on biopsychosocial causes was assessed using parent and therapist reports from...
23 items on the Beliefs about the Causes of Child Problems Questionnaire (BAC; Yeh & Hough). Acculturation was measured using 22 items from the PAN acculturation scale (Soriano & Hough, 2000). Preliminary results indicated that parent-therapist ethnic match was unrelated to parental agreement (p = .883), parent-therapist acculturation match on mainstream American culture showed a borderline correlation (p = .050), and parent acculturation to mainstream American culture was significantly correlated (p = .001) with degree of parental agreement with therapists on biopsychosocial causes of the child problems. Therefore, this study highlights the importance of parent acculturation level as a predictor of cognitive match in psychotherapy. Hopefully with greater cognitive match, or agreement, parents and therapists will have a better chance at cooperating to improve the child’s health effectively.

345 Poster #15 1:00 pm-2:45 pm
Exploring the relationship between symptomatology and parent agreement with therapists about the causes of child problems
Jessica Holliday, Psychology (M)
May Yeh, Psychology

When an adolescent begins outpatient services, the experience can be shaped by the combined inputs from the adolescent, the parent(s), and the therapist. All three parties are stakeholders in the treatment process, and have their own assumptions, expectations, and thought processes. Agreement between stakeholders on important therapy-related constructs may lead to decreases in attrition and better treatment outcomes, and it is important to understand the factors associated with greater agreement. For example, the severity of problems and the type of behavior problems exhibited by the adolescent (internalizing or externalizing) may be associated with greater agreement. The current study examined internalizing and externalizing symptomatology as predictors of parent agreement with therapists on problem etiologies as they related to the clinical care of an ethnically diverse sample of adolescents. The research was conducted via a longitudinal study of approximately 267 adolescents and their parents and therapists at the outset of outpatient mental health service use. Data were collected via face-to-face interviews that included etiological behavior and child behavior questionnaires. It was hypothesized that higher internalizing symptom scores and higher externalizing symptom scores would be associated with greater parent agreement with the therapists on the causes of the child’s problems. Regression analyses were utilized to examine the relationship between internalizing and externalizing scores from the Child Behavior Checklist with parent agreement with therapist on all etiologies in total, and then specifically on those that were biopsychosocial in nature to see if these scores could predict agreement with the therapist.
Clinical Study of the Ventricular Flow Field in LVAD patients
Vi Vu, Bioengineering (M)
Karen May-Newman, Mechanical Engineering
Congestive heart failure affects approximately 4.7 million Americans, and 0.5 million new cases are diagnosed each year. Unfortunately, the only cure is a heart transplant of which there are only 3000 available worldwide annually. Left ventricular assist devices (LVAD) are an alternative treatment, which can benefit more than 7000 new patients annually by 2015. LVAD is a mechanical pump that is surgically attached to the left ventricle (LV) and aorta. It helps reduce the heart’s workload by drawing blood away from the aortic valve and toward the heart’s apex and into aorta.

From our laboratory’s flow visualization studies using a mock circulatory loop, the altered flow pattern results in an area of stasis near the left ventricular outflow tract (LVOT). In the presence of medical devices, flow stasis has been linked with thrombus formation, which causes higher risk in LVAD patients. One example is a LVAD recipient with a severely infracted myocardium that had calcified prior to the LVAD implant. Following the LVAD implantation, a thrombus formed, was removed with additional calcification, reformed again, and subsequently caused patient death. Echocardiographic data and autopsy confirmed the presence of a large thrombus in the LVOT. This thrombus likely formed due to the disturbed flow pattern and lack of pulsatility.

The goal of our study is to develop a noninvasive method to visualize the velocity field in the left ventricle of LVAD patients. The method applies engineering analysis to a sequence of standard B-mode and Doppler flow echocardiography (Echo) images. Before and after LVAD implantation, Echo images are collected from patients at Sharp Memorial Hospital. Color Doppler images indicate the flow direction and velocity, while B-mode images record the change of LV dimension throughout the cardiac cycle. These images clearly illustrate the altered blood flow after LVAD implantations. Those sets of images are analyzed to generate the 2D flow mapping of the ventricular circulation for a better visualization of the relationship between the LV vortices and stagnation regions. This method can detect earlier blood flow abnormalities in comparison to the traditional Echo images, which only provide one dimensional flow information.

Effect of Aortic Valve Leaflet Fusion and Stiffening on Geometric Opening Area (GOA): Implications for Calcific Aortic Stenosis
Reshmi Banerjee, Bioengineering (M)
Karen May-Newman, Mechanical Engineering
Calcific Aortic Stenosis (CAS), prevalent in developed nations, is a degenerative disease involving the progressive narrowing of the aortic valve (AoV) orifice. It is clinically presented with a higher transvalvular gradient and jet velocity detected by echocardiography. Tissue remodeling involving commissural fusion and fibrotic stiffening are predictors of CAS progression and outcome. It is generally agreed upon that the onset and progression of CAS is influenced by alterations in the hemodynamic environment, wherein it is continually subjected to cyclic stretches, bending, pressures, and shear stresses. The objective of this study is to measure the effect of leaflet fusion and stiffening on geometric orifice area (GOA) and hemodynamics (pressure and flow) in the AoV using a cardiac simulator. Seven bioprosthetic porcine AoVs were tested under controlled matched conditions. Fusion was simulated by suturing the leaflet edges together along one (F1) or two of the commissures (F2) and fibrosis by applying a thin layer of cyanoacrylate adhesive on the aortic face of one of the valve leaflets (F1S, F2S). The unfused leaflet (U) was used as the baseline condition. The cardiac simulator is a mock circulatory loop that has preprogrammed settings of cardiac contractility (Off, Low, Medium) at a heart rate of 72 bpm. Pressure and flow are measured at several points in the system and a single camera (DaVIS, LaVision) mounted under the simulator records images of the valve as it opens and closes in response to biomechanical changes. Images are analyzed (Image J, NIH) to obtain the GOA values during the cycle. The mean GOA (cm²) for the U, F1, F2 and F2S conditions are 0.89 ± 0.49, 0.64 ± 0.37, 0.32 ± 0.18, 0.31 ± 0.17 respectively.

Statistical analysis has confirmed that contractility and fusion (P < 0.01) are the most significant contributors to GOA reductions, which are indicators of stenosis. Tissue remodeling due to fusion alone introduces a decrease in the average by about 28%, 64% and 65% for stiffening. While the results indicate that tissue remodeling accelerates CAS onset and progression, additional studies are required to confirm these findings.
Problem statement: In-hospital cardiac arrest (I-HCA) is a significant public health problem because it is associated with high mortality and low survival. Electrocardiography (ECG) is an important diagnostic tool to prevent and treat I-HCA. These ECG recordings may provide clues for the presence of complications and show life threatening heart rhythms that require resuscitation therapy. The ECG from the continuous monitoring systems at hospitals cannot be saved digitally. Therefore, establishing ECG predictors by analyzing different segments of ECG prior to I-HCA requires manual measurements which are time consuming and difficult. The objective of this project was to develop a method for semi-automated analysis of paper ECG tracings using digital image processing, in order to correlate changes in ECG parameters with I-HCA.

Methods: Printed ECG tracings from continuous monitoring systems were analyzed with software including MATLAB (MathWorks, Inc), PlotDigitizer (free online software), and LabChart (AD Instruments) to convert the ECG paper into a digital signal, which can be automatically analyzed to tabulate the heart rate, QRS duration and morphology. First, the paper ECG prior to cardiac arrest was scanned and saved as .jpg format. Then, MATLAB codes were tested and used to remove the background grid lines of the ECG paper. The ECG complexes were extracted from background grid line and the points on the ECG waveform were converted into coordinates. To obtain the coordinates points of ECG complexes, PlotDigitizer was used to select the points manually after confirming the horizontal and vertical axis of ECG complexes. As the last step prior to digitization, MATLAB codes were created and used to adjust the coordinates of ECG complexes and were saved as .txt format. The LabChart software was used to obtain the digitized ECG that was designed for measurements of ECG segments.

Results: Comparison between semi-automated analysis and manual measurements showed a 7% difference in calculating the heart rate, 100% agreement for measuring QRS duration and 80% agreement for visual detection of QRS morphology. The LabChart software was used to obtain the digitized ECG that was designed for measurements of ECG segments.

Conclusion: ECG digitization using MATLAB is an effective method, however, it is quite time-consuming and further technical improvements are needed to speed the digitization.
<table>
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<tr>
<th>Session C-16</th>
<th>Poster: Cardiac Biology III</th>
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<td>Friday, March 8, 2013, 1:00 pm – 2:45 pm</td>
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<th>351</th>
<th>Poster #21 1:00 pm-2:45 pm</th>
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<td>Rosiglitazone Causes Gene Expression Changes in the Neonatal Rat Cardiocyte</td>
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<tr>
<td>Carlos Brambila, Bioengineering (U)</td>
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<td>Paul Paolini, Biology</td>
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We investigated one category of mechanisms that may be responsible for observed beneficial effects on heart cells from a synthetic antidiabetic drug, rosiglitazone (Avandia™, GlaxoSmithKline) of the thiazolidinedione (TZD) family of insulin sensitizing compounds used to treat type 2 diabetes. Signaling pathways affected by this drug can be explored by measuring changes in expression levels of genes controlling these pathways. We focused on possible cardioprotective mechanisms. We hypothesized that a small number of key genes would exhibit strong changes in expression levels with time in response to rosiglitazone, perhaps including those genes controlling calcium fluxes in the cell. We carried out this experiment with an Illumina RatRef-12 BeadChip™, genomic microarray system to obtain comprehensive profiling of expression and detect up-and-down-regulation of genes caused by the drug during a 48 hour time frame. Primary ventricular cardiomyocytes were harvested from neonatal rats and plated on culture medium. Cultured cardiomyocytes were used to measure calcium transients \([\text{Ca}^{2+}]_i\) and contractility. RNA and protein were extracted and purified from cardiomyocytes treated under equal conditions. RNA was hybridized with cDNA probes for microarray analysis, and protein was used for western blot detection. Expression data were normalized and statistically analyzed via t-test. Fold changes were computed and a cluster analysis performed. Contractility analysis, qPCR, western blot and \(\text{Ca}^{2+}\) transient measurements complemented the microarray analysis. Transients were recorded from relatively uniform regions of fine structure in the cytosol to yield consistent results.

Over 3,000 genes of the 22,518 genes studied had statistically significant expression level changes with \(p\)-values < 0.5, 310 had \(p\)-values < 0.0001; 6 of the genes computationally found to be the most significantly expressed were selected for validation via quantitative RT-PCR; expression levels found were in agreement with the computational analysis. New statistical strategies permitted relatively low expressers relating to calcium flux control to be measured accurately. We identified 20 genes differentially expressed by neonatal cardiomyocytes exposed to rosiglitazone. The most significantly expressed genes occurred on the PPAR signaling pathway, consistent with the drug’s known behavior as a PPAR\(\gamma\) agonist. \(\text{Ca}^{2+}\) handling gene expression changes agreed with qPCR measurements of those genes.

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<th>352</th>
<th>Poster #22 1:00 pm-2:45 pm</th>
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<td>MitoTimer: A Novel Fluorescent Tool for the Study of Mitochondrial Turnover</td>
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<tr>
<td>Julie LaRue, Biology (U)</td>
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<td>Roberta Gottlieb, Biology</td>
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Mitochondria are organelles found in the cytoplasm of eukaryotic cells that are primarily involved in energy metabolism to generate adenosine triphosphate (ATP). When mitochondria age, they produce increased amounts of reactive oxygen species (ROS), the ultimate cause of cellular aging. The accumulation of dysfunctional mitochondria can lead to DNA and protein damage as well as senescence or even cell death. Therefore, it is important to evaluate the dynamics of mitochondrial clearance and biosynthesis. Terskikh and colleagues generated a mutant of the protein dsRed that changes fluorescence from green to red over time. We directed this mutant protein to the mitochondrial matrix by fusing it with a mitochondrial targeting sequence, then placed it into a Tet-On inducible gene expression system, a construct we named “MitoTimer.” This tool makes it possible to monitor the clearance of old mitochondria and the biogenesis of new mitochondria. Mouse embryonic fibroblasts (MEFs) derived from transgenic mice carrying Tet-On MitoTimer crossed with the rtTA tetracycline-responsive transcription factor were exposed to doxycycline and examined for mitochondrial fluorescence. We observed mitochondrial fluorescence with time-dependent color maturation of MitoTimer in MEFs. PCR analysis of spleen, liver, and heart tissues in transgenic mice revealed expression of MitoTimer mRNA upon doxycycline treatment. Western blots to confirm inducible MitoTimer expression are underway, as well as fluorescence microscopy imaging of heart and liver cryosections. This transgenic tool will enable real-time monitoring of mitochondrial turnover in vivo.

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<th>353</th>
<th>Poster #23 1:00 pm-2:45 pm</th>
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<td>Modeling of the Calcium Signal in an Adult Cardiomyocyte Sarcomere</td>
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<td>Amanda Brambila, Biochemistry (U)</td>
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<td>Paul Paolini, Biology</td>
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How does free calcium ion flow occur through the sarcomere triggering contraction? Although equations that govern \([\text{Ca}^{2+}]_i\) fluxes can be written, we wanted to visualize the process in an animation to best appreciate the pattern of the flow within a muscle cell. In our experimental studies we have focused on the role calcium ions play during the excitation-contraction coupling process, including on the expression of genes that serve in calcium transport across cell membranes. Our desire was to create a mathematical simulation to demonstrate the calcium turnover, and the dependence upon factors like abundance and transport rates of Ryr2, SERCA and NCX channels.
We have developed an initial simulation of calcium fluxes within a single sarcomere using the MATLAB™ programming environment. Assuming radial symmetry in a cylindrical sarcomere, a 2-dimensional grid model accounts for calcium exchanges within the (thick and thin) myofilaament system, between the SR’s terminal and longitudinal cisternae, and within the cytosol. A 2-D half-sarcomere was divided into pixels in the longitudinal direction. The rate of Ca\(^{2+}\) release from the terminal cisternae (TC) region was assumed to be proportional to the product of the probability of the Ca\(^{2+}\) release channel being open and the difference of [Ca\(^{2+}\)] between the TC and a pixel facing the TC. Ca\(^{2+}\) moves from element to element by simple diffusion and is taken up by the longitudinal SR via the SERCA pump. Ca\(^{2+}\) influx responsible for triggering the TC Ca\(^{2+}\) release is introduced to elements at the level of the Z-line.

An animated visualization of the fluxes uses pseudocolor to represent the calcium concentration changes vs. time in the sarcomere during a single twitch. Increases in SERCA channel density caused a faster relaxation rate of the Ca\(^{2+}\) transient.

Changes in number of Ryr2 and NCX channels altered Ca\(^{2+}\) transient amplitudes and kinetics in a manner predicted by our laboratory’s gene silencing experiments. We intend to extend the 2-D model into 3-D and to add other features relating to calcium fluxes, such as a more detailed description of the Ca\(^{2+}\)-induced Ca\(^{2+}\) release mechanism.

354  Poster #24  1:00 pm-2:45 pm
Compensatory Gene Expression in Neonatal Cardiocytes: Gene Silencing Techniques
Elesha Bartolotta, Microbiology (U)
Paul Paolini, Biology

The enzymatically isolated neonatal rat cardiomyocyte is a widely used model to investigate cardiac function. Commonly analyzed mechanisms in this cell model include protein expression, contractility, and calcium transients. Intracellular calcium [Ca\(^{2+}\);] is the central regulator of cardiac contractility. Ca\(^{2+}\) transients are used to measure the flux of Ca\(^{2+}\) from the sarcoplasmic reticulum via the ryanodine channels (RyR) and the reesequestration of cytosolic Ca\(^{2+}\) by the sarco(endo)plasmic reticulum (SERCA) pump, and the sarcoclinmial sodium-calcium exchanger (NCX). Our goal was to observe if any compensatory changes occurred in SERCA and NCX gene expression during the down-regulation of ryanodine receptor 2 (RyR2) using inhibitory RNA gene silencing (siRNA) techniques and in turn if SERCA and RyR2 expression compensate during the down-regulation of NCX.

Videos of contracting cultured cardiocytes were acquired using a digital camera attached to an inverted phase microscope. The videos were analyzed using digital image processing techniques to obtain a contraction signal. We employed a neonatal cardiomyocyte contractility measurement protocol based on computational methods, using digital video recording and shape representation of the cell by Fourier descriptors. Calcium transient data measured the [Ca\(^{2+}\);] flux using Fluo-3, a calcium-binding fluorescent dye, and a Photon Technology, Inc. fluorometer system running Felix Software. The mRNA levels were compared by reverse transcription quantitative polymerase chain reaction (qRT-PCR). Target siRNA was transfected by TransMessenger™ Reagent; qRT-PCR and Western Blot analyses were performed 48 hours post-transfection to verify down-regulation of each gene. We observed that when RyR2 is down-regulated there is a down-regulation of SERCA and an up-regulation of NCX. Calcium release is decreased and contractility impaired. In contrast when NCX is down-regulated the expression of SERCA is increased and contractile function does not appear to be significantly altered. The results confirm the compensatory function that occurs between RyR2 and SERCA expression, but it is unclear whether contractile function is altered significantly when SERCA expression is increased upon NCX down-regulation. The interplay between these three genes requires further study.

Funded by SDSU NIH Bridges to the Baccalaureate training program (3 R25 GM05106-10S1), National Science Foundation (DUE-0850283), NIH/NIGMS SDSU MARC Program 5T34GM008303-22 and California Metabolic Research Foundation.
Conclusions: FN promotes proliferation and protection of CPCs through a FN-α5β1-Pim-1 pathway. Causal contribution of FN for repair after MI is yet to be confirmed by ongoing research of a FN knock-out mouse, which has been successfully created. Acknowledgements: Funding for this project was provided by the National Institutes of Health/National Institute of General Medical Sciences (NIH/NIGMS) T34GM08303.

Session C-17
Poster: Microbiology III
Friday, March 8, 2013, 1:00 pm – 2:45 pm
Location: Library Dome

356 Poster #26 1:00 pm-2:45 pm
IL17 and Racial Disparities in Colon Cancer
Avan Hassan, Biology (U)
Kathleen McGuire, Biology

Colorectal cancer (CRC), cancer of the colon and rectum, is the third-leading cause of cancer death in developed countries. In the United States, African Americans (AA) have a higher incidence rate and mortality from CRC compared to Caucasian Americans (CA). Socioeconomic status, access to healthcare and cultural issues such as nutrition contribute to this disparity, but there is growing evidence that biological factors play a role as well. Previous research in our lab studied infiltration of immune cells into colon adenocarcinoma samples from AA and CA patients. We looked at CD8, a marker for cytotoxic T lymphocytes, CD57, a marker for Natural Killer cells, and Granzyme B (GzmB), a marker of cytotoxic immune function. These studies revealed there is a significant difference in GzmB+ cell levels with AA having a lower cytotoxic immune response compared to CA. Interleukin 17 (IL17) is a pro-inflammatory cytokine that appears to be important for defense against infectious organisms. It is made by T helper cells called Th17 as well as a few other cell types. In the context of CRC, the role of IL17 is not well understood. There are numerous studies, however, suggesting IL17 may play a pro-tumor role by promoting inflammatory and inhibiting cytotoxic immune responses. Therefore, we have analyzed IL17+ cell infiltration using immunohistochemistry in tumors from patients participating in the North Carolina Colon Cancer Study (55% CA, 45% AA). We compared IL17+ cell infiltration using the nonparametric Mann Whitney U Test and did not see a significant difference between the two races (p=0.87). Using the median (157 cells/HPF), the samples were separated into two groups based on their numbers of IL17+ cells. IL17 low (IL17L; median ≤157 cells/HPF) and IL17 high (IL17H; median=157 cells/HPF). We then analyzed GzmB levels and the correlation of GzmB+ cells with CD57+ and CD8+ cell infiltration in the IL17H and IL17L samples by race. We saw no differences by race in the IL17H samples. On the other hand, in the IL17L samples, both the GzmB+ cell levels and the correlation between GzmB+ cells and CD57+ and CD8+ cell infiltration were significantly lower in AA. These studies suggest that the lower cytotoxic responses observed in AA are more evident in tumors with low IL17 infiltration but further studies are required to determine if IL17 plays a role in the racial disparities observed in CRC.

357 Poster #27 1:00 pm-2:45 pm
Characterization of Group B Streptococcal clinical isolates and bacterial determinants that mediate Blood-Brain Barrier disruption
Efren Reyes, Biology (U)
Kelly Doran, Biology

Group B Streptococcus (GBS) is the leading cause of neonatal meningitis and infection leads to infant death 8-12% of the time in developed countries and roughly 50% of the time in developing countries. The majority of invasive GBS disease has been linked to serotype III sequence type 17 (ST-17), and there is currently no vaccine. To cause meningitis, GBS must cross the blood-brain barrier (BBB) and disruption of this barrier is a hallmark of bacterial meningitis, however, little is known of the mechanism of GBS penetration. The BBB is comprised of a single layer of specialized brain endothelial cells that function to maintain brain homeostasis by modulating the passage of molecules and nutrients from the blood to the brain. These brain microvascular endothelial cells (BMEC) exhibit complex tight junctions between the cells that provide a stronger barrier function than observed in peripheral endothelial cells. We have shown that SNAIL-1, a global repressor of tight junction proteins, is upregulated in BMEC during GBS infection causing downregulation of the important tight junction proteins ZO1 and Occludin. This suggests a novel mechanism of GBS disruption of the BBB, but the bacterial factors responsible for SNAIL-1 induction are not known. Previously, we have identified specific GBS factors that contribute to the development of meningitis, namely the secreted βhemolysin/ cytolysin toxin, and the anchor for bacterial surface expressed lipoteichoic acid (LTA). To determine if these previously reported virulence factors are responsible for the upregulation of SNAIL-1, we are in the process of measuring transcript and protein levels of SNAIL-1 following hBMEC infection with WT and mutant strains lacking toxin and anchored LTA. We have also analyzed clinical GBS isolates recently obtained from patients with GBS meningitis. Our results suggest that at least one of these isolates can be classified as serotype III ST-17. Continued studies are aimed to determine how infection with these isolates impacts SNAIL-1 transcription and BBB penetration.
Identification of a Group B Streptococcal fibronectin binding protein that mediates invasion of the blood brain barrier

Czarinah Paco, Microbiology (U)
Kelly Doran, Biology

Group B Streptococcus (GBS), is a Gram-positive, chain forming bacterium normally found in the human gastrointestinal and urogenital tract. However, GBS is a major cause of serious invasive disease in newborns, and certain adult populations including the elderly, pregnant women and those with other underlying immune deficiencies. Currently GBS is the leading cause of neonatal meningitis due to its ability to survive and multiply in the bloodstream, interact with and penetrate the blood-brain barrier (BBB), in order to gain access to the central nervous system (CNS) and cause disease. This process represents a complex interplay between the host endothelium and microbial surface components, and still remains to be completely understood. Based on homology searches we have identified a putative fibronectin binding protein in GBS that we hypothesize may contribute to BBB penetration. To probe the role of this factor we performed precise, in-frame allelic replacement of sfbA (streptococcal fibronectin binding protein A) in WT GBS to generate the isogenic mutant ∆sfbA. We then assessed the ability of this mutant to interact with immobilized fibronectin and human brain microvascular endothelial cell line (hBMEC), the cells that constitute the BBB. As predicted the ∆sfbA mutant exhibited decreased adherence to fibronectin suggesting that SfbA mediates GBS fibronectin binding. Interestingly the ∆sfbA mutant exhibited increased adherence to hBMEC, but a significant decrease in hBMEC invasion compared with the WT parent strain. Similar results were also obtained when we disrupted the sfbA gene in other GBS strains. Thus our results suggest that GBS SfbA contributes to invasion of the BBB and that fibronectin is important for these interactions. Continued studies will focus on the purification of the SfbA protein to further elucidate the mechanism of SfbA mediated GBS BBB penetration.

An Assay for the Discovery of West Nile Virus Protease Inhibitors

Intisar Khamo, Biology (U)
Roland Wolkowski, Biology

Some of the most common human viral infections are caused by members of the Flaviviridae family. The most prevalent of these are Hepatitis C Virus (HCV), Dengue Virus (DenV), West Nile Virus (WNV), and Yellow Fever Virus (YFV), that cause liver cancer, Dengue fever, meningitis/encephalitis, and hemorrhagic fever, respectively. We have decided to focus on WNV, an emerging pathogen in the US with no available treatment. A processive RNA-dependent RNA polymerase prone to errors, the emergence of resistant strains, and lack of vaccines, highlight the need for novel antivirals and innovative methods to facilitate their discovery.

We are adapting an assay previously developed for HIV-1 Protease (PR) in a Gal4 fusion context in T-cells so we can monitor the activity of WNV protease in adherent cells. The assay exploits the autocatalytic properties of PR, and the Gal4 transcription factor that is only active when the terminal DNA-binding and trans-activating domains (DBD, TAD) are linked. When the protease within the Gal4/PR fusion is inhibited, the fusion remains uncleaved, activating the reporter Green Fluorescent Protein (GFP). When protease is active, the Gal4/PR fusion is cleaved and will not induce the expression of GFP. The previous assay is being adapted to adherent cells rather than T-cells, providing a more natural milieu to mimic flaviviral infection. Unlike HIV-1, WNV protease activity relies on both protease (NS3) and cofactor (NS2B) requiring the addition of cofactor within the Gal4/PR fusion. As Flaviviridae also rely on autocatalytic cleavage of their proteome, and inhibition of this step in the viral life-cycle prevents infection, makes protease inhibition an attractive target for drug discovery.

The assay adapted for WNV Protease provides a platform for the high-throughput screening for novel inhibitors of WNV Protease utilizing flow cytometry and/or plate reader based technologies. This adaptation also provides the proof of concept for the utility of the Gal4/protease fusion system for the proteases of the Flaviviridae members. While the main purpose of the assay is to drastically facilitate drug discovery, it can also be used to study protease functions and the requirements of cofactor, whether viral or cellular, its activity.

Genes Associated with Copper Tolerance and Copper Homeostasis in Vibrios

Megan Morris, Biology/Ecology (M)
Elizabeth Dinsdale, Biology

Copper is found as a trace heavy metal within marine environments. However, coastal waters contain elevated concentrations of this trace element due to increased anthropogenic activity. Contamination of coastal environments by copper sulfate is accounted for mostly by the sources of agricultural runoff and leaching from submerged marine vessels. Southern California has a high input of copper pollution attributed to recreational, commercial and military boating. Elevated levels of dissolved copper can be toxic to marine microorganisms not equipped to tolerate heavy metal toxicity. It has been found that some microbes may have the ability to tolerate elevated levels of copper, possibly enhanced by chronic, extended exposure.
Bacterial samples were taken from three kelp forests along the Southern California coast—Point Loma, La Jolla and Catalina. Cultured Vibrio isolates, including species Vibrio splendidus, Vibrio vulnificus, Vibrio parahaemolyticus and Vibrio harveyi were analyzed for copper tolerance. MIC assays were performed to test the concentration of copper where bacterial growth was inhibited. Results demonstrated that Vibrios sampled from Point Loma have the highest copper tolerance with a mean MIC value of 225 ppm Cu, samples from La Jolla had a lower copper tolerance with a mean MIC value of 205 ppm Cu, and samples from Catalina showed the lowest copper tolerance with a mean MIC value of 162.5 ppm Cu. Therefore, we conducted a comparative genome analysis expecting that Vibrio genomes from the Point Loma kelp forest would have a higher number of genes associated with copper tolerance compared to genomes from the La Jolla and Catalina isolates. This trend was not observed, suggesting that Vibrios may tolerate copper utilizing different mechanisms.

This study will use transposon-mediated mutagenesis in order to locate and determine functionality of copper-tolerance genes of Vibrios. Results will aid in a better understanding of the physiological and genomic changes which occur in microbes as a response to prolonged exposure of copper pollution and how this compares to copper tolerance mechanisms for other microbes, including E. coli and Salmonella.

**361 Poster #31 1:00 pm-2:45 pm**

*Identification of a novel coral virus with global distribution*

Steven Quistad, Cell and Molecular Biology (D)

Forest Rohwer, Biology

Viruses have intimately affected the evolution of immunity through a constant battle between host immune response and viral evasion tactics. Virally expressed homologs of the host immune system are able to manipulate the host in favor of viral production or quiescence. Therefore, we are able to better understand a particular host’s immune system by understanding the genes expressed by their resident viral population. While it has been previously established that reef-building corals host a diverse assemblage of viruses, the interaction between coral viruses and the host immune system is completely unknown. In addition recent work has demonstrated corals possess a complex immune repertoire that is highly conserved with humans. Therefore, investigations into coral-viral interactions will not only provide insight into how the coral immune system functions, but also further our understanding of the general evolution of immunity with potential application to human immunology. Using a bioinformatic approach we identify a putative coral virus with wide distribution across multiple species and geographical ranges. Future work will focus on understanding the interaction of this coral virus with the host immune system.

**362 Poster #32 1:00 pm-2:45 pm**

*Biomass Based Phenomic Approach for Identification of Novel Viral Proteins*

Savannah Sanchez, Microbiology (M)
Forest Rohwer, Biology

In the marine environment, viruses play a large role in nutrient cycles and in modifying host mortality. Understanding these interactions between viruses and the environment is dependent on extrapolating knowledge from the viral genomes. Incidentally, only 10-25% of all viral sequences share homology to previously annotated proteins. To investigate the depth of viral diversity we aim to functionally characterize abundant viral sequences by monitoring physiological effects of the host. Here, we describe a liquid based phenotypic microarray technology for testing cellular phenotypes to provide real-time evaluations of novel viral gene functions. We evaluated various phenotypic microarray methodologies for phenomic analysis and created a standard operating protocol to ensure reproducibility in our study. The method is analyzed computationally where growth curves are fit into a logistic model. The resulting maximum growth rate and carrying capacity are used as classifiers of overall growth. These parameters are then examined under robust statistical methods to identify clusters and functional groups. The use of high throughput-put phenomic tools provides detailed analysis of taxonomic and functional diversity of viruses in the environment. The use of variables related to growth and biomass create unifying parameters for large scale phenotype profiling which can easily be integrated into other biological data and applied to various environments.

Session C-18

**Poster: Aging**

Friday, March 8, 2013, 1:00 pm – 2:45 pm

Location: Library Dome

**363 Poster #33 1:00 pm-2:45 pm**

*Affect of ApoE ε4 Status on Odor vs. Visual Naming Tasks*

Kristyn Bojorquez, Psychology (M)
Claire Murphy, Psychology

There are currently 5.4 million Americans living with Alzheimer’s disease, with numbers expected to more than double by the year 2050. Individuals who are positive for the apolipoprotein E ε4 allele are among those who are at greatest genetic risk for developing the disease. Studies have demonstrated a link between the ε4 allele and olfactory function, thus indicating the effect of Alzheimer’s disease on olfactory functioning. Past
Evidence suggests an association between obesity and impulsiveness (Jasinska et al., 2012; Pagoto et al., 2009; Yeomans, Leitch, & Mobini, 2008). However, this relationship has not yet been examined in older adults. The current study further explored this association using neuropsychological and self-report measures of impulsiveness. Body mass index (BMI) was measured in older aged individuals (age 60 and above). Impulsiveness was assessed using Barratt’s Impulsivity Scale (BIS II) as a self-report measure, and Conner’s Continuous Performance Test II (CPT II) as a neuropsychological measure. The participants included e4+ and e4- individuals recruited from the UCSD Alzheimer’s Disease Research Center. The tasks included the Boston Naming Test and the San Diego Odor Identification test, both of which require participants to name an odor or word after it has been presented. It was hypothesized that those negative for the e4 allele will perform better on the odor and visual naming tasks compared to those positive for the e4 allele.

**Impulsiveness as a predictor of obesity in older adults**

**Poster #34 1:00 pm-2:45 pm**

Karalani Cross, Psychology (U)  
Claire Murphy, Psychology (U)

The present study examined the difference between performance on two different confrontational naming tasks involving olfactory and cognitive function. The participants included e4+ and e4- individuals recruited from the UCSD Alzheimer’s Disease Research Center. The tasks included the Boston Naming Test and the San Diego Odor Identification test, both of which require participants to name an odor or word after it has been presented. It was hypothesized that those negative for the e4 allele will perform better on the odor and visual naming tasks compared to those positive for the e4 allele.

**Poster #35 1:00 pm-2:45 pm**

**10 Year Fracture Risk and Related Preventative Behaviors in the Elderly Living Independently**

Daniele Koren, Nursing (U)  
Young-Shin Lee, Nursing (U)

There has recently been an increase in osteoporosis awareness among the elderly community, however this disease is still common in both men and women. Fractures among the elderly population can lead to decreased function, decreased quality of life, and even an increase in mortality. The purpose of this study is to examine the relationship between osteoporosis awareness as well as the preventative measures that the elderly have incorporated into their lives. It also looked at fracture risks of the individuals. 33 men and women between the ages of 59 and 91 were asked to fill out surveys with the help of nursing students. Some of this information was inputted into an online fracture risk calculator. With this the 10-year risk of any fracture and the 10-year risk of a hip fracture were calculated. The results were analyzed in order to look for correlations. Results indicate that women are more likely to have heard from their health care providers that they have osteoporosis or a risk of osteoporosis. Women were also far more likely to have had a bone screening. The mean fracture risk among men was 10.6% and among women it was 29.1%. A large number of participants have some form of fracture risk reduction including 72.2% of participants who perform some sort of daily exercise and 60.6% take daily supplements for bone health. This research spreads light onto the awareness of osteoporosis and some of the behaviors that many of the elderly have that may positively or negatively affect their fracture risk. This can aid health care providers in their assessment of patient’s osteoporosis and fracture risk as well and in educating their patients on ways to reduce it.

**Poster #36 1:00 pm-2:45 pm**

**Bone Health and Acculturation of Korean-American Women**

Hyeran Seo, Nursing (BSN) (U)  
Young-Shin Lee, Nursing (U)

Background: Osteoporosis is a major public health threat for an estimated 44 million Americans and 55% of the people aged 50 years and older (The National Osteoporosis Foundation, 2012). 85% of women do not believe they are personally at risk for developing the disease. Yet, one in two post-menopausal women will be affected by osteoporosis during her lifetime (Law & Shapiro, 2005). As a prevention and treatment regimen, sufficient calcium intake is extremely important to prevent osteoporosis (Hansberger, 2006).

**Purpose:** The purposes of this study are to 1) examine awareness of Korean-American women’ perceived risk of osteoporosis, 2) examine the amount of calcium intake.
intake from diet by three age groups, and 3) assess the degree of acculturation among the participants.

Methods: A cross-sectional descriptive study includes a total of 63 Korean-American women residing in San Diego County. The participants consist of three groups based on age differences: Pre-menopausal (25-35 year old), Peri-menopausal (45-55 year old without menstrual), and Post-menopausal groups (65+ year old). Data were collected by person to person interviews with a survey. Awareness of osteoporosis and acculturation were measured by a survey questionnaire. Calcium intake was asked by using a diet recall method. Descriptive statistics and ANOVA methods were applied.

Findings: Of the participants, 33 women (60%) were unaware of the risk of osteoporosis. The peri-menopause group (aged 45-55 years) had the greatest amount of perceived risk of osteoporosis compared to pre- and post-menopause groups. Daily calcium intakes from diet were 561mg, 956mg, and 1133mg in the pre-, peri-, and post-menopausal groups, respectively and significantly different among groups. Food sources of calcium intake were significantly different by age groups. Regarding the acculturation scores, the post-menopause group was least acculturated among the three groups.

Conclusion: Korean women’s awareness of risk of osteoporosis was low. The young adult group consumed calcium from diet much lower than FDA recommended amount. The young adult group needs to increase daily calcium intake. The findings can be used to promote bone health according to different aspects of acculturation among Korean-American women. Keywords: osteoporosis, calcium intake, acculturation, Korean-American women

367 Poster #37 1:00 pm-2:45 pm
The Role of Sex, Age, and the Dementia Rating Scale on Olfactory Performance in pathologically Confirmed Lewy Body Dementia, Clinically Diagnosed Alzheimer’s Disease and Healthy Controls.
Patricia Cintora, Psychology (U)
Claire Murphy, Psychology

Dementia with Lewy bodies (DLB) is a neurodegenerative disorder that shares clinical and pathological characteristics with both Parkinson’s disease (PD) and Alzheimer’s disease (AD). This mixed cortico-subcortical neuropsychological pattern in DLB has made accurate differential diagnosis difficult. Assessments of olfactory function are noninvasive measures known to be reflective of AD progression and severity. Previous research has also indicated impaired olfactory function in DLB. The present study compared scores of odor threshold, odor identification, and odor memory in pathologically confirmed DLB (n = 27) and clinically diagnosed Probable AD (n = 27) matched for level of dementia (M = 112.80, SD = 18.22), and healthy controls (M = 140.11, SD = 3.105) matched for sex (58 % male, 42% female) and age (M = 74.7, SD = 5.4). Our goal was to investigate differences in olfactory performance in DLB and AD that may be useful in their assessment. We found that when controlling for age <= 75 years, sex and DRS, DLB participants (n = 10) had significantly poorer odor thresholds than AD participants (n = 16) and controls (n = 26). When controlling for sex, age and DRS, DLB participants (n = 15) performed significantly worse than AD participants (n = 20) and controls (n = 27) on the odor identification test. The percentage of odors correct, characterized by the total number of hits and correct rejections, indicate that when controlling for DRS >= 110, DLB participants (n = 18) perform significantly worse than AD participants (n = 18) and controls (n = 27) on odor recognition memory tasks regardless of sex and age. Results also show a significant interaction between sex and diagnosis, indicating that regardless of age and DRS, DLB male (n = 16) participants had significantly more miss responses and fewer hits for odors than AD male participants (n = 15) and controls (n = 16). However, DLB females (n = 7) had fewer miss responses and more hits when compared to AD female participants (n = 8) and controls (n = 12). This suggests that olfactory assessments may be useful in differentiating DLB from AD patients.

368 Poster #38 1:00 pm-2:45 pm
Temporal Order Memory Deficits in Huntington’s Disease
Diane Nicoll, Psychology (M)
Paul Gilbert, Psychology

The frontal lobes play a critical role in temporal order memory for sequences of stimuli. Since Huntington’s disease (HD) results in frontal-striatal circuit dysfunction, temporal order memory may be particularly sensitive to HD neuropathological degeneration. The current study examined temporal order memory in patients diagnosed with manifest HD and matched controls. Participants completed a visuospatial temporal order memory task involving manipulations of the temporal separation between two spatial locations in a random sequence of locations that varied on each trial. Studies suggest that there is more interference for temporally proximal stimuli relative to temporally distal stimuli. We found that the performance of HD patients and controls improved as a function of increased temporal separation. However, HD patients demonstrated significant impairments relative to controls, suggesting that temporal order memory is impaired in HD patients even when temporal interference is minimal. The findings identify a fundamental, yet relatively unexamined, processing deficit that may affect the execution of various daily living skills in individuals with HD.
Session C-19
**Poster: Education I**
Friday, March 8, 2013, 1:00 pm – 2:45 pm
Location: Library Dome

**369** Poster #39 1:00 pm-2:45 pm
*Teachers in the Age of Prometheus*
Sean Armijo, MALAS (M)
William Nericcio, English and Comparative Literature

Introducing Promethean Boards into the classroom revolutionized the classroom. Today, teachers as well as students not only possess limitless information via the Promethean Board, but hold unprecedented ways in which to present and interact with this data. The board is seen as a great tool for the teachers to effectively engage their students on a daily basis, but is that all? With its ability to connect to students so easily, is the Promethean Board a prototype for the teacher of tomorrow?

Research for this essay utilizes several different disciplines. Evaluating the board’s physical features and capabilities is not enough. This essay consults the myth of Prometheus as well as the work of Marshall McLuhan to gain a deeper understanding of the device. To supplement these two fields, personal work observations at a middle school as well as qualitative interviews with teachers are made.

The aforementioned sources in this research yield many results. The board itself is not yet a media completely understood. Its ability to converge several forms of media makes it similar to that of the internet. The myth the board personifies reveals not just a gift, but the means of destruction. McLuhan’s proclamation comes true through the Promethean Board. A board founded on visual stimuli exhibits a generational shift in preference to visual over auditory media. Personal observations confirm the Promethean Board’s ability to be both a gift and problem to the classroom. Interviews from teachers demonstrate a staggering lack of training. From the seven interviewed only two were completely fluent in using the device.

The conclusion reveals follow up research must occur. What is most needed is time. The Promethean Board is still in its infancy. It is simply too early to tell if it’s the prototype teacher. Time reveals not only the evolution of the board, but the teacher’s as well. Will the active interest in treating it as a tool persist, or will its tempting ease of use cause the teacher to slowly defer its role as prime educator to the board? Time and consistent research in this field will tell.

**370** Poster #40 1:00 pm-2:45 pm
*Prosocial Behaviors in Elementary-Grade Students*
Maria Mendoza, Liberal Studies (U)
Valerie Pang, Teacher Education

The purpose of the study is to investigate prosocial and negative student behaviors on the playground. In this research it is important to observe the actions of children when they are not being supervised. It is important in a democracy that children be responsible citizens. Researchers identified prosocial behaviors as being friendly and respecting others, waiting in line, and collaborating with peers. The study also examined negative behaviors such as aggressive or bullying actions. Researchers observed first, fourth, and sixth graders during recess at a local elementary school. The study found that elementary-grade students exhibited more prosocial behaviors during structured activities like basketball and soccer. These sports have rules that have been explained to the students by an adult. These activities have identified behavioral expectations. Students exhibited more negative behaviors when playing on the swings and using the tetherball area.

**371** Poster #41 1:00 pm-2:45 pm
*Leadership in a Mandarin Immersion Program: All Students Learning Multiple Languages as an Essential 21st Century Skill*
Brenna Kiely Battin, Educational Leadership (D)
Douglas Fisher, Educational Leadership

The purpose of this case study was to identify specific leadership qualities and behaviors needed to lead a Mandarin language immersion program. Due to the increase in Mandarin immersion programs being offered throughout the United States, this study was warranted. The case study also sought to determine the skills deemed to be essential for all students in a globalized 21st century society, as perceived by the study participants. The participants in this case study were the principal, teachers, support staff, and parents at one noncharter public school in the southwest region of the United States, with the implementation of Mandarin immersion program underway.

The researcher aimed to answer three research questions: (a) How does the principal perceive his leadership role in implementing a Mandarin immersion program in an elementary school? (b) What do the teachers, support staff, and parents perceive as the vital components in implementing a Mandarin immersion program? and (c) What skills do students need in a globalized 21st century society, as perceived by the principal, teachers, support staff, and parents?

This qualitative case study utilized three data sources: principal, teacher, support staff, and parent interviews; school and
According to the American Psychiatric Association (2000), 3% of students with Attention Deficit Hyperactivity Disorder (ADHD) have difficulties with self-awareness and self-control, particularly self-regulation on a daily basis. However, many students have School-aged students are expected to exhibit appropriate academic performance for ELL populations with an RTI framework will be discussed. Significant reading proficiency disparities exist between English Language Learner (ELL) students and their native English-speaking counterparts. Improving the academic performance of ELL students requires a focus on the prevention and early intervention for students who struggle in reading. In the current study, an alternating treatment design was used to investigate the effectiveness of two commonly used reading fluency interventions: repeated reading (RR) and word decoding (WD). The outcomes were analyzed using visual analysis as well as the percentage of non-overlapping data (PND). Both, word decoding and repeated reading showed an increase in fluency for a second grade, Spanish-speaking ELL male receiving special education services. Implications for providing early literacy interventions for ELL populations with an RTI framework will be discussed.

Effectiveness of Self-Monitoring Intervention for Student with ADHD: A Single Case Design
Kieu Tang, School Psychology (M)
Katina Lambros, Counseling and School Psychology

School-aged students are expected to exhibit appropriate self-regulation on a daily basis. However, many students have difficulties with self-awareness and self-control, particularly students with Attention Deficit Hyperactivity Disorder (ADHD). According to the American Psychiatric Association (2000), 3% to 7% of school-aged children are diagnosed with ADHD. These students typically demonstrate problems with impulsivity, sustained attention, organization, task completion, and frequently disrupt classroom instructions. Follow up studies of students with ADHD reported significantly higher rates of grade retention, special education placement, and school dropout (DuPaul & Stoner, 2003). Although medication is currently the most popular treatment for ADHD, medication alone is inadequate for addressing students’ academic and social performance challenges (DuPaul & Stoner, 2003; Purdie, Hattie, & Carroll, 2002; Shapiro, Durnan, Post, & Levinson, 2002). Effective interventions also need to address the academic behaviors of skill acquisition and rate and accuracy of work completion (Purdie et al., 2002; DuPaul & Stoner, 2003). This study examined the effectiveness of a self-monitoring intervention for a 2nd grade student with ADHD. A single-case reversal design with fading component (A-B-A-B-C) was used to measure the intervention’s impact on the student’s academic engagement. The results of this study showed improvement in student academic engagement (from 61% pre-intervention to 87% post-intervention). Furthermore, the student maintained a high level of academic engagement (87%) during the fading phase in which he recorded his behavior less frequently, suggesting that the self-monitoring intervention maintained its effectiveness over time.
and plan for future action. In summer 2012, the faculty mentor received a President’s Leadership grant to support this project. In addition, students raised additional funds and leveraged campus resources to support this project. The proposed poster presentation highlights how students used these funds and the tools of action research to build a library that mirrors the SDSU Children’s Center philosophy and model reputation.

Session C-20
Poster: Cancer Research
Friday, March 8, 2013, 1:00 pm – 2:45 pm
Location: Library Dome

375 Poster #45 1:00 pm-2:45 pm
Survival Factors in Children with Central Nervous System Brain Tumors using the California Cancer Registry between 1988 and 2009
Katrina Flores, Epidemiology (M)
Suzanne Lindsay, Graduate School of Public Health

Brain and central nervous system tumors (CNS) are the leading cause of death in children due to solid tumors. Quality treatment of these patients is a critical factor for increasing their chances of survival. Longitudinal population-based studies have examined incidence and survival rates for children with brain and CNS tumors. However, little is known about the relationship between first course of treatment (e.g. surgery) and overall survival in childhood brain tumor patients. Further, research indicates that the type of treatment facility patients receive care is an important factor, with high-volume hospitals having better outcomes and lower rates of mortality when compared to low volume hospitals. Still, little is known about the outcome of children with brain tumors who receive treatment from high-volume treatment facilities vs. low volume facilities. The purpose of this historical prospective study was to examine how demographic and treatment characteristics were associated with survival in children with brain tumors. This study examined 3,562 children less than 20 years of age from 1988 to 2009 using the California Cancer Registry (CCR), a statewide cancer surveillance registry. This study focused on patients diagnosed with the following most frequent brain tumors: 1) pilocytic astrocytoma, 2) astrocytoma, NOS, 3) primitive neuroectodermal tumor (PNET) 4) medulloblastoma, NOS and 5) glioma malignant. Kaplan-Meier survival estimates were used to examine survival estimates and the log rank test was used to examine the differences between groups. One-, three-, five-, and seven-year survival rates were compared for demographic characteristics, tumor types, and type of hospital facility (e.g. high-volume). Multivariate analysis was conducted for covariates using the Cox proportional hazard model. These findings will provide critical information about factors that are associated with survival in children diagnosed with brain tumors. More importantly, these findings will have implications on the treatment decisions physicians make when addressing their patients needs.

376 Poster #46 1:00 pm-2:45 pm
Early Detection of Ovarian Cancer Based on Sensitive Analysis of Biomarkers Using Nonlinear Laser Wave Mixing
Sashary Ramos, Chemistry (U)
William Tong, Chemistry

Novel nonlinear laser wave-mixing spectroscopy is presented as a highly sensitive absorption-based detection method for biomedical applications. Wave mixing offers inherent advantages including excellent sensitivity, small sample requirements, short optical path length, high spatial resolution and excellent standoff detection capability. The sensitivity provided by laser wave-mixing is ideal for the detection of specific biomarkers, such as those associated with ovarian cancer. Cancer antigen 125 (CA 125) and human epididymis protein 4 (HE4) are the only two biomarkers for ovarian cancer approved by the Food and Drug Administration (FDA). Sensitive detection of CA 125 and HE4 by laser wave mixing will improve the effectiveness and reliability of early diagnosis of ovarian cancer. In a typical wave-mixing setup, the signal is generated when the two input beams intersect in the sample containing labeled or native biomarkers. The wave-mixing signal is a coherent laser-like beam and can be collected with virtually 100% efficiency and minimal background noise. The signal has a cubic dependence on laser power and a quadratic dependence on analyte concentration, and hence, it is inherently suitable as a chemical sensor. The biomarker, carcinoma antigen 15-3 (CA 15-3), is associated with breast cancer, epithelial ovarian cancer and lung cancer. After the laser wave-mixing detector is optimized using CA 15-3, we will demonstrate sensitive detection of CA 125 and HE4 in order to improve early diagnosis of ovarian cancer, a cancer with few specific symptoms. The concentration range of HE4 in a healthy person is very low (0-150 pM), and hence, our ultrasensitive laser wave-mixing detection method is inherently suitable for the diagnosis of this challenging cancer.

377 Poster #47 1:00 pm-2:45 pm
Does Quality of Life among Cancer Survivors Differ by Socioeconomic Status?
Elizabeth Medeiros, Public Health (U)
Sheila Castaneda, Public Health

Background: Little is known about quality of life (QOL) among cancer survivors of different socioeconomic status (SES) levels. Given that SES is strongly correlated with access to quality care and timely treatment, it was hypothesized that QOL would
ABSTRACTS

**378 Poster #48 1:00 pm-2:45 pm**

*Cognitions and Cancer Screening in Hispanic Americans*

Alexandria Booker, Psychology (U)
Vanessa Malcarne, Psychology

Although the prevalence of cancer in Hispanic Americans (HAs) is lower than in other ethnic groups, HAs have an elevated risk of cancer mortality. Screening for cancer is recommended and has been linked to earlier diagnosis and increased survival rates. The current study aimed to identify cognitive correlates of screening adherence in an adult community sample of HAs. Participants were asked whether they had obtained a mammogram (for women) or a prostate-specific antigen (PSA) test (for men), and how long ago the test occurred. Adherence was defined as having been screened within the past two years. Adherent and non-adherent men and women were then compared on several health-related cognitions, including knowledge of cancer causes and perceptions of control over health and cancer risk. Out of a larger sample of 436, analyses were restricted to individuals for whom mammograms or PSA tests are recommended (i.e., women over 40 years or men over 50 years), which resulted in \( n = 121 \) women and \( n = 64 \) men. Results showed that 45.3% \((n = 29)\) of men and 77.7% \((n = 94)\) of women were screening adherent. Independent sample t-tests showed no significant differences between adherent and non-adherent men and women for acculturation, health literacy, health-related locus of control (4 subtypes), or knowledge of the causes of cancer. Most of the women reported being screening adherent; thus, it was difficult to test differences based on adherence in this group. Less than half of the men reported being adherent; more research is needed to examine what factors can increase screening behaviors in HA men. Future research should examine the cognitive correlates of cancer screening in a larger sample to better understand if the rate of adherence observed in this sample is a trend across the population, as well as to identify what factors may motivate the HA population to practice health behaviors.

**379 Poster #49 1:00 pm-2:45 pm**

*Degenerate Four-Wave Mixing: An Ultrasensitive Laser Detection Method for Cancer Biomarkers*

Eric Maxwell, Chemistry (M)
William Tong, Chemistry

We present an ultrasensitive, label-free, antibody-free detection method for cancer biomarker carcinoembryonic antigen (CEA) using nonlinear fourwave-mixing laser spectroscopy and capillary electrophoresis. Wave-mixing spectroscopy provides a sensitive absorption-based detection method for low concentration levels of molecules of interest. This is accomplished by splitting of a single laser beam into two excitation beams, which are then focused through a sample cell. A diffraction grating is created at the intersection point of the input beams, which diffracts light to create two coherent signal beams. The stronger signal beam may be collected by a photodetector with high optical efficiency and low signal-to-noise ratio. Wavemixing is sensitive enough to detect molecules in their native form without the use of fluorescent labels. Separation of proteins in a serum sample may be obtained by capillary electrophoresis, which separates molecules by electroosmotic flow (EOF). A solid-state 20 mW, 266nm UV laser can be used to excite CEA native protein samples. Initial testing on Coomassie Brilliant Blue G250, using a 10 mW, 633nm helium-neon laser, has demonstrated an estimated picomolar limit of detection. Since the wave-mixing signal has a cubic dependence on laser power, limit of detection will therefore
improve even further with a stronger source beam. Moreover, wave-mixing spectroscopy in conjunction with microfluidics offers sensitive and specific detection of biomarkers for early disease detection and diagnosis, sensitive monitoring of environmental samples, and reliable detection of chemical/biological agents.

Session D-1

Oral Presentation: US and US Ethnic History
Friday, March 8, 2013, 3:00 pm
Location: Library Addition 2203

380 3:00 pm

Western Feminism vs Post-Colonial Feminism: Same Struggle or Different Worlds?

Nikki Junker, History (U)
Eve Kornfeld, History

Naomi Wolf is a political activist and the author of the best selling book The Beauty Myth. She was born and raised in the United States. Leymah Gwobee is a Nobel Peace Prize winner from Liberia. She lead the anti war movement that ended the 2nd Liberian Civil War, which landed her as the subject of the documentary Pray the Devil Back to Hell. These women are two of the most influential feminists in the world. In this paper, I have contrasted two types of feminism by examining these two women and their respective types of feminism. Included in my thesis is the proposition that Wolf falls into the school of “Western Feminism”, while Gwobee can be defined as a “Post Colonial Feminist”. Western feminists argue that the struggle for women’s rights is universal and that the same school of thought can be used throughout the world to label those who work to further the status of women. On the other hand, we have post colonial feminists who argue that the issues facing them as part of a post colonial population are much different than that of western feminists and therefore must be dealt with in a separate manner. Using the existing works of Wolf and Gwobee as primary sources I was able to build a complete profile of each type of feminism. I also used current works by feminists throughout the world who have provided their stance on the issue of segregated feminism. I came to the conclusion that this schism in ideology does exist and is much more problematic than a simple difference of opinion. It threatens to turn feminists against one another, rather than against oppression. Within my text, I discovered how this rift between schools came to be, what feminists can do to strengthen their movement throughout the world and why they must address the issue.

381 3:15 pm

Children and Childhood Experiences Before and During the Japanese-American Incarceration Camps

Brittany Daniloff, History (U)
Eve Kornfeld, History

After the attacks on Pearl Harbor in 1941, the continuing distrust of Japanese and Japanese-Americans reached its peak and Executive Order 9066 was issued, which allowed some or all persons to be removed from designated areas of the United States. Eventually, this order allowed the relocation of all Nikkei, or all persons of Japanese descent, living along the Pacific to be relocated to incarceration camps. Despite children often being viewed as a minority group when it comes to research, exploring the children’s experiences and how these incarceration camps affected their lives remains vital, especially since children made up about 25,000 of the total number of detainees.

A variety of primary sources produced by the detained children, such as poetry and letters, support the research done on their experiences. By using textual and psychological analysis when reading the letters children wrote, their experiences, whether detrimental or beneficial, become prominent. These letters that Japanese-American children wrote to a San Diego based librarian, Clara Breed, offer various insight to their experiences after the Pearl Harbor attacks, during the relocation, and while they were detained. In addition to these letters, a variety of classroom diaries that children in Poston, Arizona kept included drawings of the camp, letters from children, and photos of the incarceration camps themselves. The use of several secondary sources and further psychological analysis supports research about the living conditions within the camps and the family traditions that were being altered while detainment continued.

The experiences of the detained Japanese-American children varied from psychologically damaging to pleasant and relieving. The children experienced mistreatment (including post-Pearl Harbor racism) from peers before the relocation, the relocation and readjustment to a new lifestyle in the incarceration camps, and the new traditions that the children’s family adopted while detained. By using different methods of analysis on the letters, drawings, and poetry, these sources help to clarify the emotions that these children felt while being detained. Although these camps were intended to detain those of Japanese descent, the camps ultimately changed the lives of those detained.

382 3:30 pm

True Causes of the 1992 Los Angeles Riots

Shane Bailey, History (M)
Edward Blum, History

Even before it became a state, California was a symbol of America’s expansion west. It embodied the nation’s iconic
frontier society and characterized the idea of America as a “land of opportunity.” This perception of California, particularly Los Angeles continued to grow through the nineteenth and most of the twentieth century. However, for many Americans this perception of Los Angeles as a sort of paradise changed on April 29th, 1992. Millions watched on the news as the city of angels exploded into a five day long riot, where millions of dollars of property was destroyed and fifty-three people lost their lives. The cause of the riot was believed to be the acquittal of four white Los Angeles Police Officers who were charged with assaulting and using excessive force on Rodney King, a black man. However, like most incidents of social unrest there were deeper and more impactful issues at work. This research will focus on the deeper socioeconomic reason behind the Los Angeles riots. It will explain how the riot was not the immediate reaction to the decision of the Rodney King trial but result of long stemming frustrations possessed by the underprivileged citizens of the city. Furthermore, I will examine how race relations changed not just in California but also throughout the country after the riots.

The Los Angeles riots of 1992 are a relatively recent historical event. Therefore historical scholarship on the matter is lacking. Although secondary sources will be an important part of this research the majority of information for my argument will come from primary sources. I will focus mostly on newspapers and other forms of media from the time to study how these sources portrayed the Rodney King beating, the trial that followed and the riot itself. Furthermore, I will use media sources and others such as court cases, police reports, local and city government policies and complaints against the local law enforcement to discover what the underlying causes were for the social tensions and frustrations in Los Angeles that resulted in 1992 riot.

Alexander Leighton’s research conducted during his time living with Japanese Americans in Poston. Japanese American women’s experience living in an American concentration camp during World War II is important to the overall understanding of the impact the camps had on the Japanese Americans.

384 4:00 pm

Did slavery end in 1865? A review of the literature on Afro-pessimism

D. Alexandra Hunt, Liberal Arts (M)
William Nerio, English and Comparative Literature

Theories of race occupy a central role in every arena of social life in the United States. This rings true for academia. Biologists work to understand why Alzheimer’s disease is more prevalent in White people than Black people. Geographers map food availability to study the relationship between racial segregation, food options and health. Educators investigate best practices to close the achievement gap between White students and students-of-color. Theoretical paradigms for understanding race range from the sociobiological (i.e., race as a genetic determinant of socio-cultural characteristics) to constructionist (i.e., race as a social construct that reflects the ideology of the dominant group in a given society). This presentation offers a literature review of an emerging paradigm for understanding race named Afro-pessimism. Guided by the work of Frantz Fanon, Afro-pessimists seek to clarify the meaning of Blackness not as an identity category but as structural position of Western society that is continually and gratuitously open to violence. In other words, Afro-pessimists including Frantz Fanon, Orlando Patterson, Ronald Judy, Saidiya Hartman, Hortense Spillers, Jared Sexton and Frank B. Wilderson, argue that to be Black is to be a Slave; although chattel slavery in the United States ended in 1865 the Master-Slave dialectic and the institutions that maintain its coherence persist under different guise.

Session D-2

Oral Presentation:
Migrants: Social and Psychological Distress
Friday, March 8, 2013, 3:00 pm
Location: Love Library 410

386 3:00 pm

Sex and Psychological Distress Among Three U.S. Migrant Groups in the USA

Keith Lyons, Sociology (U)
Enrico Marcello, Sociology

Studies have consistently shown that mental health is positively associated with a healthy sex life. However, there is little research investigating how sex and satisfaction with sex are associated
with psychological distress among foreign-born residents of the United States. We utilize 2012 Los Angeles County Mexican, and 2007 Boston Metropolitan (Brazilian and Dominican), Immigrant Health & Legal Status Survey data to test whether sexual behavior and satisfaction with sex are negatively associated with psychological distress among foreign-born Brazilian, Dominican and Mexican adults. We conclude by discussing how sex and distress are related among these populations, as well as how other individual and sociogeographic factors may modify this relationship.

### 387 3:15 pm

**Employer-sponsored Health Insurance, Medical Care and Migrant Psychological Distress.**

Kirsten Kessler, Sociology (U)
Enrico Marcelli, Sociology

Research has shown that foreign-born residents of the United States are less likely to have health insurance, and if insured less likely to have employer-sponsored health insurance (ESHI). It is also the case that immigrants are less likely to have a regular place of medical care (Goldman, Smith, and Sood 2005; Marcelli 2004). However, few studies examine how insurance coverage and medical care access are associated with mental health. Using 2012 Los Angeles County (Mexican) and 2007 Boston Metropolitan (Brazilian and Dominican) Immigrant Health & Legal Status Survey data, we investigate whether ESHI coverage and having a primary care provider are negatively associated with psychological distress among foreign-born Brazilian, Dominican and Mexican workers residing in metropolitan Boston and Los Angeles, controlling for a host of other individual and social factors (e.g., home, neighborhood, work, social capital).

### 388 3:30 pm

**Deportation and Migrant Psychological Distress**

Jessica Monterrubio, Economics (U)
Enrico Marcelli, Sociology

Previous research on foreign-born residents of the United States has demonstrated that both documented and undocumented immigrants may be vulnerable to experience stress caused by thoughts of deportation and/or by the presence of immigration authorities such as ICE (Hacker et al 2011; Hagan and Rodriguez 2004). However, there is a lack of research on the psychological distress experienced by immigrants after the deportation of someone residing in their household or a family member. Using the 2012 Los Angeles County Mexican, and the 2007 Boston Metropolitan (Brazilian and Dominican), Immigrant Health & Legal Status Survey data we estimate whether having a family or household member deported is positively related to migrant psychological distress; controlling for home, neighborhood, and work environment, social capital, and individual characteristics and behaviors.

### 389 3:45 pm

**Marital Conflict, Civic Engagement and Distress among Dominican, Mexican and Singalese Migrants**

Genesis Reyes, Nursing (U)
Enrico Marcelli, Sociology

Studies have shown that foreign-born residents in the United States who experience marriage/partner conflict in the home are more likely to be psychologically distressed. We employ the 2012 Los Angeles County Mexican Immigrant Health & Legal Status Survey (LAC-MIHLSS) and 2007 Boston Metropolitan Immigrant Health & Legal Status Survey (BM-IHLSS) data—controlling for home environment, socioeconomic status, neighborhood context and other individual characteristics—to test whether those residents who experience marriage/partner stress in the home are more likely to have been psychological distressed. We also estimate whether social capital (measured as civic group participation and interpersonal networks of reciprocity) mediate the positive association between marriage/partner conflict.

### 390 4:00 pm

**Remitting and Psychological Distress among Foreign-born Migrant Workers in Metropolitan Boston and Los Angeles**

Paige Leneski, Biology (U)
Enrico Marcelli, Sociology

Although many studies have investigated factors influencing how much money foreign-born residents of the USA send to their countries of origin, which mode immigrants use to send money home, and how remittances are used by recipients (Marcelli and Lowell 2005)—and others have estimated the relationship between remittances and the well-being of recipients in sending nations or communities (Conway and Cohen 1998)—there is almost no research examining how remitting affects senders. One study that does, finds that remitting may cause both financial and emotional stress among those who send money home (Johnson and Stoll 2008). In this study we analyze 2012 Los Angeles County Mexican, and 2007 Boston Metropolitan (Brazilian and Dominican), Immigrant Health and Legal Status Survey data to test whether remittance amount and sending frequency are positively, and using remittances to meet basic needs is negatively, associated with psychological distress among foreign-born Brazilian and Dominican migrant workers residing in metropolitan Boston and among foreign-born Mexican workers in Los Angeles County. We conclude by discussing how other individual and sociogeographic factors, in addition to remittance behaviors and use, are associated with distress.
The undocumented student community operates within the dominant culture of the general student body. It is important to understand how they navigate through the dominant culture and community, and interact with one another. This group is of particular interest because of their rapidly evolving identity that has taken place amidst the changing laws regarding immigration and their rights as students in the United States, specifically in California. Assembly Bill 540 and the California Dream Act have drastically changed this population’s status as students in the country. Because unorganized multiple self-conceptions do not allow for a psychologically required sense of sameness and continuity (Schachter, 2003), these new bills and confusing rhetoric in politics and media can force this group to quickly construct identities without time to properly educate themselves.

This study examined if increased community empowerment can result from community integration among official and unofficial groups of students, and if both groups are culturally willing to increase integration to work towards community goals. Interviews and surveys were conducted to assess each group’s cultural willingness and perceptions of the other group. This research analyzed factors that influence community empowerment among the undocumented student community such as self-perception, meta-perception, and community engagement. The dimensions of the variables were analyzed through an empowerment model that suggests four strategies for facilitating the empowerment process and related outcomes: (a) enhancing environmental support and resources, (b) enhancing group structure and capacity, (c) removing social and environmental barriers, and (d) enhancing environmental support and resources (Fawcett et al., 1995).

This study investigated whether community presence and recognition can be increased to help integrate communities, and contribute to the broader social structure by creating common goals to be achieved through community partnership. It is posited that increased formal strategies of integration will result in greater sense of community empowerment among the undocumented student community. This study will benefit documented and undocumented students by promoting community sustainability within the larger community. Based on this study, educational institutions can better understand their student body’s needs by interpreting student interaction among the campus community.
FOCUS: A model to identify organisms present in metagenomes based on codon usage
Genivaldo Silva, Computational Science (M)
Robert Edwards, Computer Science

Motivation: One of the major goals in metagenomics is to identify the presence of organisms in the microbial community from a huge set of unknown DNA sequences; this profiling has valuable applications in multiple important areas of medical research such as disease diagnostics. Nevertheless, it is not a simple task, and many approaches that have been developed are slow and depend on the read length of the DNA sequences.

Results: Here we introduce FOCUS, an innovative and agile stochastic model to profile and report organisms present in metagenomic samples based on codon usage without sequence length dependencies. The program was tested with simulated metagenomes, and the results show that our approach has 90% accuracy at inferring the organisms in random communities.

Conclusion: The algorithm presented will help biologists explore the microbes present in their samples, and identify which organisms are present. A web-server and the project implementation in python are available at http://edwards.sdsu.edu/focus.

Plugin architecture for creating algorithms for bioacoustic signal processing software
Christopher Marsh, Computer Science (M)
Marie Roch, Computer Science

Animal bioacoustics, the study of sound produced and received by animals, is assisted by signal processing and classification algorithms that allow researchers to quickly analyze recordings that may be sparsely populated with interesting animal sounds. Several publicly available programs allow researchers to write and execute their own algorithms that automate the detection, classification, and localization of these sounds. However, it can be difficult to write algorithms for these programs. Development requires intimate knowledge of the host environment, development in other languages is not easily supported, and the algorithm must be redeveloped to run in other bioacoustics packages. Two of the most popular software packages used for marine mammal bioacoustics, Ishmael and PamGUARD, are written in programming languages that are not widely used by the bioacoustics community, adding to this challenge. An application programming interface (API) has been developed to resolve these issues by providing a plugin framework for creating algorithms for these programs. This API permits algorithms to be written once in a wide variety of languages and provides seamless integration into the aforementioned packages. We hope that this will promote the sharing and reuse of algorithm code between bioacoustics researchers.

Determining Dolphin Species by their Echolocation Clicks: A Study of the Effects of Site Variability, Noise, and Recording Equipment Differences
Johanna Stinner-Sloan, Computer Science (M)
Marie Roch, Computer Science

There are already a few methods in existence for classifying odontocetes ("toothed whales", including all dolphins and porpoises) based on the cepstral features of their echolocation clicks. The research that we have done is towards developing methods for removing ocean background noise from the clicks, better rejecting anthropogenic clutter in the form of sonar, and providing compensation for differences between recording equipment in order to reduce the error rates of the classification. Previous methods have utilized two-pass systems in order to first identify areas of clicks and later narrow down focus onto those specific areas to extract the click features without utilizing any form of noise removal. The method developed during the course of our research is a one-pass system that detects potential clicks based on their relative Teager Energy (the energy required to produce them). Sonar pings are located by observing the correlation between the times of possible clicks and removing those that appeared at regular intervals consistent with sonar systems. Unreliable clicks are further removed by checking for clipping, the length of the clicks, and the percentage of frequencies over a designated threshold. Noise is calculated as a moving average over areas of sufficiently low energy that are of distant from areas with dense echolocation activity. This research was done using recordings of Pacific White-Sided Dolphins and Risso’s Dolphins found off the coast of Southern California from autonomous seafloor moored instruments. Current results show that although the error rate still remains above that of our two pass baseline system, removing the ambient noise from the click features improves the classification results over a large number of semi-randomized tests.
The novel fold of a virion structural protein revealed by computational and crystallographic analysis of viral dark matter

Victor Seguritan, Computational Science (D)
Anca Segall, Biology

The estimated >10^30 viruses in the oceans and sediments are poorly characterized and remain the largest reservoir of unexplored genetic diversity on Earth. Metagenomic surveys of these and other biomes have yielded a deluge of viral sequences, the vast majority of which are too dissimilar from characterized proteins to predict their function. The substantial fraction of viral open reading frames (ORFs) that encode virion structural proteins are particularly difficult to recognize by sequence similarity because of their rapid divergence, likely driven by selective pressures to keep pace with rapidly changing host defenses. We report a novel approach for identifying virion structural proteins that does not rely on sequence similarity, but instead employs artificial neural networks (ANNs), metagenomics, and metaproteomics. Using this approach, we were able to putatively annotate ~4.2% of the unknowns as virion structural proteins. These viral ORFs might encode either previously-characterized protein structures or completely novel folds. To investigate these possibilities, the protein encoded by a randomly-selected ORF with putative structural function was crystallized. The resulting structure identified both a novel fold and a domain similar to the known structure of the satellite tobacco necrosis virus coat protein. Our results demonstrate the utility of ANNs in predicting protein function without relying directly on conserved sequence alignments to known proteins, thereby opening a new window on the vast dark matter of unknown viral diversity.

Feedback interaction network between the microRNA miR-124 and the Notch signaling pathway

Jerry Chen, Computational Science (D)
Robert Zeller, Biology

The nervous system-enriched microRNA miR-124 is necessary for proper nervous system development, although the mechanism remains poorly understood. Here, through a comprehensive analysis of miR-124 and its gene targets, we demonstrate that, in the chordate ascidian Ciona intestinalis, miR-124 plays an extensive role in promoting nervous system development. We discovered that feedback interaction between miR-124 and Notch signaling regulates the epidermal-peripheral nervous system (PNS) fate choice in tail midline cells. Notch signaling silences miR-124 in epidermal midline cells, whereas in PNS midline cells miR-124 silences Notch, Neuralized and all three Ciona Hairy/Enhancer-of-Split genes. Furthermore, ectopic expression of miR-124 is sufficient to convert epidermal midline cells into PNS neurons, consistent with a role in modulating Notch signaling. We demonstrate that miR-124 is activated downstream of a series of proneural basic-helix-loop-helix transcription factors, suggesting that these genes operate collectively in a feedback regulatory network. Finally, we have developed a mathematical model which quantitatively explains how this feedback interaction network governs Ciona PNS formation. Interestingly, the genes encoding all of the factors in this network have recently been demonstrated to convert human fibroblasts into neurons. Our results thus provide important functional insight into how miR-124 promotes neuron differentiation, and should motivate future studies on this important microRNA.
in pre-vocalic and post-vocalic contexts via measurement of the resonating frequencies (formants) of the vocal tract that are evident on spectrograms using Praat software.

Data collection is complete. Reliability will be accounted for by a second research assistant who will analyze the first 40 words of each word list. Formant comparisons will be made between languages (Spanish vs. English), language backgrounds (Early vs. Late bilingual) and context (pre-vocalic vs. post-vocalic) using repeated measures analysis of variance.

399 Poster #2 3:00 pm-4:45 pm
**Associative versus repetition priming in Aphasia**

Jamie Brown, Speech, Language, & Hearing Sciences (U)
Tracy Love, Speech, Language, and Hearing Sciences

A well-known characteristic of language in individuals diagnosed with Broca’s aphasia is a difficulty understanding complex sentences. Theories have been posited to explain these deficits; one of which points to a processing delay originating at the lexical (word) level. Prior research has in fact supported this Delayed Lexical Activation Hypothesis at both the sentence and single word level (Prather et al., 1997; Love et al., 2008; Ferrill et al., 2012). These studies have used priming paradigms that require the participant to make lexical or semantic judgments about successive stimuli, some using semantic associates to test for priming; others using repeated or identical items. It remains to be seen if delayed priming is unique to language or if it extends to other nonlinguistic domains (i.e., with non-word stimuli such as pictures and non-nameable shapes).

In the current study, we explore the nature and timing of lexical activation in Broca’s participants by employing a list priming paradigm with varying prime-target intervals (500ms, 1000ms, 1500ms) to test for priming of either of semantic associates or repeated items. The purpose is to identify the conditions that lead to successful priming in Broca’s participants as compared to non-Broca’s brain damaged controls and unimpaired controls.

With a lexical decision task (word/non-word) preliminary analyses for associative vs. repetition priming suggest that brain damaged participants (controls, N=5 and Broca’s, N=10) show robust repetition priming effects at all three intervals; i.e. there is no delay in priming. Interestingly however, Broca’s and brain damaged controls do not show the same associative priming patterns, with Broca’s participants exhibiting a greater delay (priming at 1500ms) than their peers (1000ms delay). The implications of these results will be discussed.

400 Poster #3 3:00 pm-4:45 pm
**Language Proficiency Influences Lexical Competition in Monolinguals and Bilinguals**

Michelle Ortega, Speech, Language, & Hearing Sciences (U)
Dr. Henrike Blumenfeld, Speech Language and Hearing Sciences

Previous studies have shown that monolinguals and bilinguals exhibit parallel activation of words with similar phonological onsets (Marian & Spivey, 2003). The ability to access numerous lexical representations appears to be mediated by language proficiency. (Kroll & Stewart, 1994). The present study employed an eye-tracking paradigm to investigate auditory comprehension of similar sounding lexical competitors in English (e.g., cherry and chair) by English monolinguals and English-Spanish bilinguals.

Participants completed a language experience and proficiency questionnaire to determine eligibility for the study. In the first session, behavioral tests (e.g. Peabody Picture Vocabulary Test, Test de Vocabulario en Imágenes Peabody) were administered to participants in their respective language(s) to assess receptive vocabulary. In the second session, participants were presented with auditory stimuli via headphones. Participants selected the image that matched the auditory stimulus from four images on a computer screen while their eye-movements were tracked.

In the critical trials, a shared onset of at least two phonemes (e.g., cherry and chair) allowed for coactivation between the target and the competitor words. The remaining two quadrants of pictures contained fillers, items unrelated to the target and competitor (e.g. bird and train were fillers to cherry and chair). If participants looked at the competing pictures more than the filler pictures, parallel activation of the two lexical items was present.

Preliminary data show that both groups had an accuracy rate above 95 percent on word recognition tasks. There was a difference of 192.6ms in reaction time between the groups, with monolinguals (M=1701.4, SE=40.4) responding faster than bilinguals (M=1893.9, SE=48.3), t(36)=2.8,p=.008. Visual inspection of eye-tracking data revealed that bilinguals looked to the target picture (e.g., “chair”) later than the monolinguals did. Bilinguals reached peak target activation at 1620ms post word onset, while monolinguals reached peak activation at 1460ms. Bilinguals also made fewer looks to the competitor (e.g., “cherry”) than monolinguals did. This suggest that bilinguals take longer in word recognition, perhaps because their other language provides additional lexical items to choose from compared to monolinguals. Further analysis of language proficiency differences within and between monolinguals and bilinguals will be presented as a key factor in lexical activation.
**Approaches to Child Language Assessment**  
Davonna Lowe, Speech, Language, & Hearing Sciences (U)  
Sonja Pruitt, Speech Language and Hearing Sciences  

Frequently, speech-language pathologists are given the task of determining whether or not a child from a linguistically diverse background presents with a language difference, or a language disorder. Typically, a battery of standardized tests is performed to determine whether or not the child’s language abilities deviate from the normal range. Problematically for these linguistically diverse children, these standardized measures have been normed for typically developing monolingual English speaking children. This often results in inaccurate identification language disorders. The constraints of these standardized measures make it necessary for clinicians to seek alternative means of assessing these populations. Language sample analysis (LSA) has been valued as an assessment tool for children of these backgrounds. LSA has been viewed as a nonbiased tool in identifying language delay among linguistic minority children. The purpose of this study is to compare results from standardized tests to results from LSA measures to see if they paint a cohesive picture of bilingual children’s language abilities.

Twenty-four typically developing preschoolers from a low-income elementary school participated in this study. Twenty minute language samples were elicited from the children using narrative retells and age appropriate toys to elicit conversational language. The samples were transcribed and coded by a trained research assistant using the Systematic Analysis of Language Transcripts (SALT). Measures from these samples (Mean Length Utterance in both words and morphemes, total number of words, and type token ratio) were derived and compared to a normative group of children with similar linguistic backgrounds and ages range using the SALT database. In addition to LSA, these children were given standardized measures of vocabulary, grammar, cognition, and school readiness. Performance on these standardized measures was then compared to these children’s performance on measures from their language samples. Data analysis is on-going.

The findings from this study will provide details about how children’s performance on standardized and criterion measures relate. Such details will provide speech-language pathologists with details needed to support a holistic approach to assessment, rather than using a one size fits all approach to language assessment.

**Voice Onset Time in Early vs. Late Spanish-English Bilinguals**  
Annelise Brumley, Speech, Language, & Hearing Sciences (U)  
Jessica Barlow, Speech, Language, and Hearing Sciences  

This study evaluates voice onset time (VOT) differences in Spanish and English among early and late Spanish-English bilinguals. The speech sounds /p t k/ in Spanish have consistently short VOTs word-initially when compared to English, whereas after the sound /s/ (as in “stamp” and estampa) the values are similar between languages. We wish to determine if early Spanish-English bilingual adults (who learned both languages before 5 years of age) have VOT length differences word-initially and after /s/ when compared to their late counterparts (who learned English after age 5).

One goal is to determine whether English and Spanish have different VOT measures overall for bilinguals and whether these VOT lengths vary by context and age of acquisition (AoA). We expect to see longer VOTs word-initially in English versus Spanish. Additionally, we predict that early bilinguals will have longer English VOTs compared to late bilinguals word-initially due to their differing English AoA. Furthermore, we predict that early and late bilinguals will have similar VOT lengths in Spanish, as well as following the phoneme /s/ in both languages.

The data was collected from 16 women and 4 men aged 18 to 23 years (mean: 20.8 years). The participants were separated into two groups of 8 women and 2 men based on whether they learned English early or late, as defined above, all having learned Spanish at birth. The average AoA of English for early bilinguals was 2.5 years, and 7.4 years for late bilinguals. The participants were recorded reading English and Spanish lists of 177 words, with /p t k/ words repeated three times each in the carrier phrase, “Say ___ again,” in English and “Di ___ ahora” in Spanish.

Data collection is complete. We are currently acoustically analyzing the data using Praat software to measure VOTs. In addition, VOT measurement reliability on the first 40 words of each participant is being determined by a second researcher. From the data we compiled, we will compare VOTs between languages (Spanish vs English), language backgrounds (early vs late), and contexts (word-initial vs after/s/), using a repeated measures analysis of variance.
**403 Poster #6 3:00 pm-4:45 pm**

*Attention and language in Children with Specific Language Impairment*

Jennifer Kostlan, Speech, Language, & Hearing Sciences (M)
Tracy Love, Speech, Language, and Hearing Sciences

Children with specific language impairment (SLI) have structural language deficits in the absence of frank neurological impairment. Deficits of sustained attention in the absence of clinically diagnosable attention deficits have also been documented (Finneran, Francis, & Leonard 2009). The current study seeks to accomplish two goals—to replicate the finding of a deficit of sustained attention, while expanding it to a more complex split attention task, and to investigate whether any observed attention deficits might relate to the structural language impairments in this population. Participants aged 6-16 years were presented with a continuing performance task (CPT) on a laptop computer. The task consisted of three videos, with one, two, or three shapes (circle, square, triangle) moving in a pseudorandom pattern on the screen. As a measure of sustained attention, participants monitored one of the shapes (the circle) and responded by button press when that shape turned black, but were instructed to not respond when either of the other two shapes (when present) turned black. As a measure of their ability to split their attention, participants responded when either the circle or triangle turned black. Preliminary data suggest that the children with SLI performed worse than matched typically-developing controls both for the sustained and for the split attention measures. Further analyses relating these deficits to their language abilities are ongoing. These results and their implications will be discussed.

**404 Poster #7 3:00 pm-4:45 pm**

*Detailing the Language Growth of Children from at-risk backgrounds*

Sarah Hershkowitz, Speech Language Pathology (M)
Sonja Pruitt, Speech Language and Hearing Sciences

Research has shown that preschool children from low socioeconomic backgrounds and English language learners (ELL) show deficits in school readiness, as demonstrated by poor performance on assessment measures. Such weaknesses have been linked to the fact that these children often begin kindergarten with significantly less linguistic knowledge (Purcell-Gates, McIntyre, & Freppon, 1995). One approach designed to improve the outcomes for these children uses speech-language pathologists within the classroom to create a language rich environment (Justice et al., 2008). This approach has proven successful for a group of local preschoolers from a low income, culturally diverse neighborhood. Specifically, the children in both conditions showed gains in vocabulary and syntax (Pruitt-Lord, Engel, & Pace, 2012). The purpose of the current study is to determine which variables contributed to the children’s language growth. Twenty-four typically developing children participated in this study. All children were enrolled in classrooms that serve at risk children and are funded through Head Start and the California’s public pre-K initiative. All educational services are provided in English with translation as needed. The children come from homes with varied language backgrounds (Percentage of English heard = 45.5; Spanish = 60.91; Other = 70.0) and low levels of parental education (mothers’ mean education levels = 9.47; fathers’ = 10.4). Data come from standardized test scores, language sample measures, and caregiver questionnaires. Standardized test scores included measures of vocabulary, grammar, and cognition. Elicited conversational language samples using toy sets and picture descriptions were transcribed, and measures of vocabulary and grammar were calculated. Parent questionnaires provided information on language background and education level of adults in the household. Data analysis is on-going.

Results have implications for educators and speech-language pathologists working with diverse populations. An understanding of the variables that impact language growth of preschool children will allow us to develop preventive methods and educational programs for children entering school from a low income, culturally diverse neighborhood.

**Session D-13**

**Poster: Latina Health II**
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

**405 Poster #8 3:00 pm-4:45 pm**

*Factors Associated With Self-Care Practices And Healthcare Use in Latinos With Type 2 Diabetes*

Elena Lenkova, Biology (U)
John Elder, Graduate School of Public Health

Introduction. As of 2010, 25.6 million, or 11.3%, of U.S. residents aged 20 years and older were living with diabetes. According to the CDC, self-care practices such as healthy eating, being active, and monitoring blood sugar are important aspects of disease management that help people with diabetes lead normal lives. A better understanding of how to improve self-care among patients is necessary to decrease adverse health outcomes related to diabetes. This study will assess how the factors of social support, depression, and health literacy are associated with self-care practices, healthcare use, and ultimately blood glucose levels (as determined by HbA1c) in patients with diabetes.
Methods. Secondary analysis was run on baseline data from the Puentes Hacia Una Mejor Vida/Bridges to a Better Life study, part of the international Peers for Progress network. Patients (the majority Latino) with diabetes and an elevated HbA1c level (>7) from Clinicas de Salud del Pueblo Inc. in Imperial County, CA completed interviews with trained evaluation staff, which included questions on depression, social support, health literacy, self-care, and healthcare use.

Results. Patients who had type 2 diabetes accounted for 90.5% of the sample. The mean age of the participants was 56.5 years and 63.1% of the sample was female. Descriptive mean scores and standard deviations for health literacy and depression were 7.3 (2.06) and 15.02 (5.78), respectively. Health literacy was assessed using the short 3-item Health Literacy Scale and depression was assessed using the 8-item Patient Health Questionnaire. The mean HbA1c level of the sample was 8.4%, which is 1.5% higher than the recommended blood sugar level. Initial analyses reveal that depression, social support, and health literacy taken together are significantly associated with HbA1c levels (p=0.017).

Conclusion. Targeting depression, social support, and health literacy in patients with diabetes may improve HbA1c levels. Future analyses will investigate whether there are associations between these factors and self-care practices and healthcare use. It is important to understand the relationship between depression, social support, health literacy and blood glucose levels in order to help patients better manage their diabetes.

407 Poster #10 3:00 pm-4:45 pm
Perceived Environment, Safety and the Relationship between Walking Around a Neighborhood & Physical Activity among Churchgoing Latinas
Natalicio Serrano, Health Science (Public Health) (U)
Christina Holub, Center for Behavioral and Community Health

Over 47% of Latina women are physically inactive. Few studies that examined the association between neighborhood walkability and physical activity (PA) have involved Latina women. This research is important because walking in the neighborhood can facilitate reaching PA recommendations, and may be influenced by the availability of places to walk within a neighborhood, the perceived environment and perceived safety. The current analysis examines (1) Latinas’ perceptions of the walkability of their neighborhoods and (2) the relationship between perceived neighborhood and PA levels. Two hundred nine churchgoing Latinas completed a baseline survey as part of a randomized controlled trial testing an intervention designed to promote PA. The average age of the women was 42 years (ranging from 18-65), with about 65% making less than $2,000 a month. Moderate to vigorous physical activity (MVPA) data were collected through accelerometers and perceived neighborhood walkability was assessed using the Neighborhood Environment Walkability Survey. Most women (81.3%) reported having sidewalks in their neighborhood, and 89.2% reported that sidewalks are “somewhat” or “very well” maintained. However, more than half (54.5%) considered the street lighting to be poor or non-existent. When examining the relationship between PA and walking around the neighborhood, those who reported “some” or “always” walking were significantly more likely to meet MVPA guidelines of 150 mins/week compared to those who did not report walking around their neighborhood (p<0.05). There is evidence that walking in the neighborhood is associated with meeting PA guidelines.
Although participants reported that sidewalks are of good quality, over half reported poor street lighting. This augments previous research showing that the environment, including aspects like having sidewalks, street lighting, and having destinations to walk may play a role in PA and, for Latinas, meeting PA guidelines.

408  Poster #11  3:00 pm-4:45 pm

Relationships between objectively measured physical activity and sleep duration and sleep quality among Latinos
Hena Din, Public Health (M)
John Elder, Graduate School of Public Health

INTRODUCTION: Quality of sleep has shown to have a positive relationship with health outcomes. Disrupted sleep has shown to adversely affect health and appears related to cardiovascular disease and obesity. Level of physical activity (PA) may be associated with sleep quantity and quality but results are inconsistent and PA is usually measured by self-report. The purpose of this study was to examine the relationship between objectively measured moderate-to-vigorous PA (MVPA) and sleep duration and sleep quality in a sample of Latino adults.

METHODS: One hundred sixty one adults (90.1% female, 86.3% Latino/Hispanic, with a mean age of 40.29 ± 10.8 and BMI = 29.87 ± 5.64) were recruited to a community fitness program and completed a self-reported survey at baseline about their activity and completed a self-reported survey at baseline about their activity and sleep duration and sleep quality over the past 4 weeks. PA was measured using a GT3X accelerometer worn at the hip for 7 days. Hierarchical linear regression was used to assess the amount of variance in sleep quality and duration that was explained by PA, adjusting for demographic and work related factors.

RESULTS: Mean sleep quality was 1.83 ± .69 (1=best sleep, 5=worst sleep), mean sleep time was 7.99 ± 1.03 hrs/night. Mean level of moderate-to-vigorous physical activity was 190.56 ± 116.26 min/wk. There was no significant association between PA and sleep quality or sleep duration when adjusting for demographic and work related factors. Having children in the household under the age of 18 was negatively associated with sleep quality (p = 0.026).

CONCLUSION: The use of objectively measured physical activity in this study indicates that moderate-to-vigorous physical activity is not associated with sleep quality and sleep duration in this sample. Immense variation in mean MVPA in the sample may contribute to the lack of significant association. Previous associations found in research on PA and sleep may be a result of bias or error found in self-reporting. Further research is needed on the relationship between PA and sleep, as well as on the effect of confounding variables.

This study was supported by grant 1R18DP002138-01 from the Centers for Disease Control and Prevention (PI, Marshall; School of Exercise & Nutritional Sciences).

409  Poster #12  3:00 pm-4:45 pm

Association Between Sleep Duration and Weight Status Among Hispanic Latina Women
Shaylyn Stark, MPH (M)
Elva Arredondo, Graduate School of Public Health

Background Obesity is a major epidemic in the United States that affects greater than one-third of adults and has a greater impact on minority populations than non-minority populations. Hispanic Latina women are 1.3 times more likely to be overweight or obese as compared to non-Hispanic White women. Being overweight or obese increases an individual’s risk of developing chronic diseases. Due to the risks associated with obesity, efforts have been focused on identifying risk factors of the disease. One identified risk factor is shorter sleep duration. The purpose of the current study is to examine the relationship between sleep duration and weight status among church going Hispanic Latina women in San Diego County.

Methods This study utilized baseline measures from an intervention implemented to increase MVPA among Hispanic Latina women. Participants included 193 Hispanic Latina women aged 18 to 65 years with a mean age of (41.41 ± 10). To measure the effect of sleep duration on weight status, linear regression was performed holding demographic variables constant. Weight status was categorized using the following CDC guidelines: BMI <24.9 normal weight, BMI ≥ 25.0 overweight or obese. Sleep was categorized using the following CDC sleep recommendations for adults: ≥ 7 hours of sleep per night considered sufficient and <7 hours considered insufficient.

Results The majority of participants reported their country of origin as Mexico (94.26%), reported having less than a high school education (58.37%) and reported a household income of less than 2,000 dollars per month (65.46%). Average BMI was (30.51 ± 6.35) and 23.92% of participants reported sleeping <7 hours per night. Linear regression indicated that sleep duration was not significantly associated with BMI (p = 0.06). However, a higher percentage of overweight or obese participants were not meeting sleep recommendations (25%) as compared to participants classified as normal weight (19%).

Conclusions Although not statistically significant, the trend found in this study is in agreement with previous research that has identified a relationship between sleep duration and BMI. Further analysis accounting for other factors that affect energy expenditure should be performed to gain a better understanding of the relationship between sleep and weight status.
Rates of diabetes are rising rapidly worldwide. In the US, Latinos and other ethnic minorities are disproportionately affected by these trends. Higher levels of social support are associated with health behaviors that are critical for diabetes prevention, including physical activity and favorable dietary intake. However, little is known about the association between social support and diabetes in the US Latino population. We explored the relationship of structural and functional social support with diabetes prevalence among participants from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). HCHS/SOL is a cohort study of 16,415 Latino adults aged 18-74 years, recruited from four US cities (Chicago, IL; Miami, FL; Bronx, NY; San Diego, CA). The current analyses included 5187 HCHS/SOL participants [42% ≥ 45 years old; 77% born outside of US mainland; 55% women (all weighted to 2010 US census)] who completed structural social support (Cohen Social Network Index) and functional social support (Interpersonal Support Evaluation List-12) measures. Diabetes was defined as present if any of the following criteria were met: fasting glucose ≥126, glycosylated hemoglobin ≥ 6.5%, post-oral glucose tolerance test glucose ≥200, and/or, on glucose-lowering medication. Diabetes prevalence was 15.8% (95% CI 14.5%, 17.2%; weighted to 2010 US census). Logistic regression analyses showed that after adjusting for design effects, sample weights, and demographic factors, fewer high contact roles (OR=1.08, 95% CI 1.02, 1.14) and lower perceived social support (OR=1.15, 95% CI 1.04, 1.27) were each significantly related to increased diabetes prevalence. On average, one less social role and one SD lower perceived support related to 8% and 15% increased odds of prevalent diabetes, respectively. The cross-sectional study design limits assessment of directionality; however, this study suggests that reduced structural and functional support are associated with a modestly elevated diabetes prevalence among US Latinos. These findings may help inform future prevention and intervention efforts.

**Results:** The total size of the social support network was 567 supporters. On average participant’s had 2.6±2.08 supporters in their network. Seventeen participants (8%) reported having no social support for PA. 57% of the supporters were female. The majority of support came from a spouse (26.7%), their children (20.8%), or a friend (17.5%). Overall, the most common type of support was encouragement (62.4%). Partner/spouse, children, and friends most often provided encouragement as a type of support. Overall, participants felt that they were supported somewhat (mean = 2.96±1.2) and were somewhat satisfied (mean = 3.26±1.2) with the level of support that they received.

**Conclusion:** This study suggests that most support for PA comes from a partner or spouse. The type of support provided by the support network varied by type of supporter, but encouragement was most common type of support. Further research should examine if the type and level of social support is related to PA level.

This study was supported by grant 1R18DP002138-01 from the Centers for Disease Control and Prevention (PI, Marshall; School of Exercise & Nutritional Sciences).
on Climate Change. This increase could affect the availability and quality of sea turtle nesting habitat. This investigation, a collaborative effort of Sea Turtle Conservancy, PRETOMA, Osa Conservancy and The Science Exchange Sea Turtle Internship Program, took place at Pejeperro Beach, San Miguel Beach, and Tortuguero Beach in July and August of 2012. These beaches are monitored by the collaborating organizations for nesting of five out of seven of the world’s endangered sea turtle species: greens, olive ridleys, leatherbacks, hawksbills, and loggerheads. Data were collected following the World Wildlife Fund (WWF) Temperature Monitoring Manual (2009). At each beach, slope data were collected with an abney level along 60 five-meter transects distributed evenly over three separate 100-m zones that represent zero, low, and high turtle nest density areas according to the expert opinion of the supervisor from each organization. Two of these slope surveys were implemented, one at the beginning of the study and one at the end, in order to capture short-term natural rates of change in topography due to factors such as erosion and accretion of sand from wind, tides, currents, rivers, storms as well as turtle nest excavations and loss of sand from human activities. To predict the possible beach area loss from sea level rise in 2100, we took the average of the first and second survey elevations of each sample point and subtracted 0.6 m to simulate flooding of the beach. Only a few of our 1279 sample points were flooded resulting in a loss of 6% of the sampled beach area at Tortuguero. The site with the most dramatic loss was at Pejeperro Beach, with a predicted 14% of the high nest density zone potentially being underwater by 2100. Conservation recommendations to mitigate for impacts of sea level rise on nesting beaches are continued slope surveys, promoting and enforcing development set back regulations, and hatchery programs to protect nests that are threatened with inundation.

413 Poster #16 3:00 pm-4:45 pm

Taxonomy of the winged popcorn flower: Cryptantha pterocarya (Boraginaceae)

Regina Dowdy, Biology (U)
Michael Simpson, Biology

Cryptantha pterocarya (Boraginaceae), the winged nut popcorn flower, is distinguished in part by nutlets with marginal wings that are typically distinctly lobed. Three varieties of this species have been accepted in recent treatments: C. p. var. cycloptera, which has four, homomorphic nutlets with the wing entirely encircling the nutlet body; C. p. var. pterocarya, which has heteromorphic nutlets, in which one is unwinged and the other three are winged with the wing not extending at the nutlet base; and C. p. var. purpusii, which has homomorphic or heteromorphic nutlets, with the wing very reduced in width and not extending at the nutlet base. We tested the taxonomic validity and examined the variation of these three varieties of C. pterocarya by examining voucher specimens from numerous herbaria. We quantified differences among specimens by measuring: 1) calyx length; 2) calyx width; 3) corolla limb width; 4) nutlet body length; 5) nutlet body width; 6) nutlet wing width (at widest point); 7) nutlet wing width (at apex); 8) nutlet wing width (at base); and 9) gynobase stipe. We also assessed whether nutlets were homomorphic or heteromorphic by measuring these categories separately. All type specimens of the three varieties were examined and quantified, and all specimens were georeferenced for mapping distributions. Principal components analysis and ANOVAs for discrete characters were calculated. Two varieties, var. cycloptera and var. pterocarya, are distinctive and correspond with type morphologies. Variety purpusii is quite variable in some features, but generally falls out as a discrete taxon. However, we noted two other forms. The “pseudocycloptera” form is similar to var. pterocarya but is homomorphic, with all four nutlets winged. The “truncata” form is similar to var. cycloptera, but is heteromorphic, with the odd nutlet truncate at the base (having no basal wing). These five varieties and forms show some grouping with regard to biogeographic distribution. We conclude that the two new forms of Cryptantha pterocarya may best be treated as additional varieties of the species.

414 Poster #17 3:00 pm-4:45 pm

Studying effects of land use change on water quality and flooding in an urban watershed

Patrick Murphy, Environmental Sciences (U)
Matthew Rahn, Environmental Sciences

Land use change in the San Diego River watershed is a major issue facing the area today. There are many problems associated with the conversion of land from rural to urban, including increased impervious surface, altered hydrology, and nonpoint source pollution. This study aims to install water quality monitoring stations along two portions within Alvarado Creek, an important tributary of the San Diego River. The sensors will be installed in an upper and lower region of this sub-watershed. This will provide information on understanding how urbanization impacts the watershed. The stations are designed to remotely transmit data and provide real-time monitoring capabilities, which will allow us to detect changes as they happen. The results provided from this study will help inform land management practices and understand how to address the increased risk of flooding in urban areas.
415 Poster #18 3:00 pm-4:45 pm

Analytical method development of persistent organic pollutants using GCxGC/TOF-MS in desert tortoise plasma samples

Billionrosannae Chhouk, Environmental Sciences (U)
Eunha Hoh, Graduate School of Public Health

Persistent organic pollutants (POPs) can negatively affect an exposed population by altering an organism’s motor, cognitive, and behavioral abilities and ultimately decreasing a population’s survivability and reproductive fitness. While there has been many studies performed concerning the prevalence of POPs on mammals, birds, and fish, little research has been dedicated to study how POPs accumulate in reptiles, particularly the endangered desert tortoise. The goal of this project is to contribute novel findings on how POPs can be detected in desert tortoises by analyzing blood samples. Analysis of multiple cases of POPs at trace levels in plasma samples is challenging. Therefore, we will evaluate comprehensive two-dimensional gas chromatography coupled to mass spectrometry (GCxGC/TOF-MS) for the analysis. Also, the extraction and clean up method for plasma samples will be evaluated. The analytical method developed will help us determine the baseline of desert tortoise body burden to POPs.

416 Poster #19 3:00 pm-4:45 pm

Urbanization and Stream Channel Erosion in San Diego County: The Use of Remote Sensing to Estimate Stream Channel Geometry

Kristine Taniguchi, Geography (M)
Trent Biggs, Geography

Urbanization and the spread of impervious surfaces can cause an increase in runoff and peak flow, which are primary drivers in stream channel erosion. With an increase in impervious surfaces, less precipitation is infiltrated into the ground, and more water is transported directly into the stream channels. Hydromodification, the alteration of flow and sediment loading associated with urbanization, can induce stream channel erosion, degrade aquatic ecosystems, and damage existing infrastructures. San Diego Stormwater Copermittes are required to manage runoff discharge rates and durations from all Priority Development Projects to prevent increased erosive forces from degrading the channel beds and banks. To ensure that there has been no significant stream degradation due to increased erosive forces produced by new development, stream channel geometry pre and post development must be measured through costly and time-intensive channel surveys. The use of contemporary, high-resolution imagery could be used as a method to estimate stream channel geometry without the need of field measurements. This study will use channel dimensions obtained in the field to assess the ability of remote sensing to accurately characterize channel geometry in San Diego County. Hand digitizing channel widths from high-resolution imagery could be a useful tool in assessing the effectiveness of stormwater and stream channel management.

417 Poster #20 3:00 pm-4:45 pm

An investigation into the Anomalous Rising Groundwater Levels Beneath Kearny Mesa, California and Its Implications on Human Health Risk

Ronel Skoda, Environmental Science (U)
Matthew Rahn, Environmental Sciences

Releases of solvents from a former aerospace manufacturing facility in Kearny Mesa, California have been under investigation by the County of San Diego, Department of Environmental Health (DEH) since 1986. Chlorinated solvents (perchloroethylene, trichloroethylene, and others) are dissolved in the groundwater and occur as DNAPL at a depth of 150 feet. Redevelopment of the site began after the dismantling of the General Dynamic plant in 1997, when the water table beneath the site ranged from approximately 110 to 140 feet below ground surface. Since that time, residential structures and commercial businesses have been built on portions of the property. Human health risk assessment based upon groundwater levels at the time indicated that there was no risk for redevelopment. Ongoing groundwater monitoring and sampling at this and nearby sites indicated that the water levels have risen as much as 80 feet in the intervening 13 years, and continue to rise. Although the contamination levels and groundwater depth do not yet present a health risk, there are concerns that there will be risks in the future. In addition, residents in the recently built condominium have become aware of and alarmed by the potential for the contamination to present a risk to them.

Anomalous changes in groundwater levels have also been observed in wells at other sites near the former General Dynamics plant. Analysis by DEH staff of these observations has revealed a pattern in the rate of change of groundwater elevation. The actual source of the rising groundwater levels is under investigation. By plotting changes in the groundwater elevation from numerous sites in the vicinity, we have been able to delineate the potential source of the leak. Efforts are underway to identify and mitigate the leak before the water level rises to the point where contaminated groundwater threatens public health.
Previous research has shown that the visual stimuli accompanying a news article can influence the recall of memories about the events in the article (Garry, Strange, Bernstein, and Kinzett, 2007). The purpose of the current study was to investigate the effects of visual and semantic stimuli, in a Muslim-related news article, on attitudes toward Muslims. A convenience sample of 74 women and 37 men between the ages of 20-68 years was recruited via email and surveyed online. Participants were presented with a CNN news article about an event involving Muslims. The article was manipulated to contain either neutral or negative semantic stimuli (e.g., crowd/mob) and was accompanied by a neutral, negative, or anti-American image (i.e., peaceful protesters, angry protesters, protesters burning an American flag). A survey following the article assessed attitudes toward Muslims. We predicted that participants would have more negative attitudes toward Muslims when reading a negatively worded article as opposed to a neutrally worded article. We furthermore hypothesized that participants would have more negative attitudes toward Muslims after reading an article accompanied by a negative or anti-American image as opposed to a neutral image. We found that participants reported more negative attitudes toward Muslims after reading an article with negative semantic stimuli as opposed to neutral semantic stimuli. Specifically, participants were more likely to rate Muslims as fanatics and less likely to rate them as tolerant of other religions in the negative semantic stimuli condition as opposed to the neutral semantic stimuli condition. An interaction between visual and semantic stimuli revealed that participants in the anti-American image condition were more likely to agree that the media are negative about Muslims than when they were presented with neutral semantic stimuli. Our findings elucidate a link between exposure to negative rhetoric in conjunction with Muslims and negative attitudes toward Muslims. We strongly emphasize the importance and necessity of continuing to investigate the effects of semantics and images used by the news media as well as in popular culture.
are related to reduced substance use in adolescence (Aloise-Young, Hennigan, & Leong, 2012). However, very little research has compared the relationship between concepts of possible future selves and alcohol use across Latino and Native American adolescents. In the present study, Latino and Native American adolescents completed surveys measuring concepts of possible future selves, predicted future substance use, and beliefs about pursuing higher education. The results showed that Latino adolescents had stronger concepts of negative future selves (e.g., be unemployed) than Native American adolescents, and that Native American adolescents had stronger concepts of positive future selves (e.g., travel, spend time in nature). In addition, the results showed that predicted substance use was associated with concepts of possible future selves for Native American adolescents, but not for Latino adolescents. Similarly, predicted substance use was associated with beliefs about pursuing higher education for Native American adolescents, but not for Latino adolescents. The findings suggest that Native American adolescents are more likely than Latino adolescents to perceive substance use as a barrier for achieving positive future selves.

421 Poster #24 3:00 pm-4:45 pm
**Determining Factors Important in Influencing ASD Community Stakeholders Participation in an Academic-Community Collaboration**
Emily Spurgeon, Psychology (U)
Amy Drahota, Psychology
Successful academic-community collaborations (ACCs) increase communication, cooperation and trust between researchers and community stakeholders, generate feasible and useful innovations, and help to close the gap between research and community practice. However, factors influencing an individuals' decision to participate in an ACC are not well understood. ASD community stakeholders, previously contacted to participate in an ACC, completed the Decision to Participate questionnaire (DPQ). Ten ACC participants and 8 non-participants completed the DPQ, which asks individuals to rate the importance of items selected a priori in their decision to participate in an ACC or not. Using independent sample T-tests, four items were found to be statistically and meaningfully different between the groups. ACC participants rated networking with other providers (p = .007; effect size (ES)=1.74), the fit of collaboration with agency philosophy (p = .011; ES=1.31), and the opportunity for future training/consultations (p = .034; ES=1.16) as factors more important in their decision to participate in the ACC than non-participants. Non-participants reported the number of requests to participate in research more important in their decision to participate (p = .015; ES=1.48) than participants. Considering the networking opportunities, collaboration philosophy, opportunities for training, and amount of research requests being made of community stakeholders may aid in building and sustaining successful ACCs. Keywords: Academic-community collaboration, decision to participate, community stakeholders,

422 Poster #25 3:00 pm-4:45 pm
**The Effects of Professionalism and Ethnicity on the Likelihood of Being Hired**
Colleen Healy, Psychology (U)
Barbara McDonald, Psychology
Previous research suggests that professionalism and ethnicity of individuals applying for a formal job position are predictors of job acceptance. This study evaluated willingness to hire, perceived professional demeanor, and recommended salary in relation to the professional behavior and ethnicity of the applicant. A convenience sample of 62 participants ranging from 18 to 33 years old were asked to complete a survey based on their opinion of a video interview. Four videos were created to manipulate the professionalism and ethnicity of the applicant, in which two male actors, one Caucasian and one African American, portrayed a Master’s student interviewing for an internship position. Interviewee’s appearance, type of speech and verbal fluency were manipulated to create the professional and unprofessional conditions. Participants were told that a psychology professor was looking to hire a paid intern and that her TAs had collected preliminary applicant interviews to aid in her decision. The participants were also told that they would provide an outside, unbiased rating of the applicant for the professor to review before scheduling a face-to-face interview. Survey questions assessed the participant’s opinions on important variables such as: the professionalism of the interviewee, their likelihood to hire the interviewee, their recommended salary for the interviewee and their opinion on the appropriateness of the interviewee’s demeanor. Results showed that our manipulation of applicant professionalism was successful such that participants rated the applicants with professional behaviors as more professional than the applicants showing less professional behaviors. The African American applicant received higher professional behavior ratings than the Caucasian applicant, independent of manipulated professionalism. Professionalism of the applicant was a significant predictor of recommended salary and significant correlations were found between the participants’ opinion of the interviewee’s demeanor and the likelihood that the participant would hire the interviewee. These results suggest that professionalism, more than ethnicity, may have a significant effect on job acceptance.
423  Poster #26  3:00 pm-4:45 pm
Organizational socialization as a mediator of the relationship between employee proactive behavior and engagement
Elisa Torres, Industrial & Organizational Psychology (M)
Mark Ehrhart, Psychology
Previous research has shown that proactive behavior and employee engagement are important for effective employee performance. The current study sought to expand on previous research regarding the relationship between employee proactive behavior and engagement by examining a possible mediator of the relationship. Employee socialization, or the process of an individual transitioning from an organizational outsider to full insider status, was proposed as an important mediator of the relationship between proactive behavior during socialization and engagement after job placement. In other words, employees that seek more information when they first enter the organization should be more effectively socialized into the organization, which subsequently should increase the extent to which they are fully engaged in their work. One hundred and thirty-two participants were studied from a U.S. rail-transportation organization. All participants were taking part in a management training program. Data were collected via an online survey at three separate time points: at the beginning of the management training (Time 1), at the completion of training (Time 2), and four months following placement into a management position within the organization (Time 3). The measures evaluated employee proactive behavior in the form of feedback seeking (Time 1), socialization (Time 2), and engagement (Time 3). The socialization measure consisted of six dimensions: performance proficiency, politics, people, organizational goals/values, language, and history. It was predicted that socialization would mediate the relationship between employee proactive behavior and employee engagement. Based on regression analyses, the study's primary hypothesis was supported; socialization was found to mediate the relationship between employee proactive behavior and engagement. Additional analyses with the individual socialization dimensions showed that the results were consistent across all dimensions except for the language dimension. This research demonstrates the importance of the socialization process for increasing employee engagement, in addition to suggesting that organizations should consider the inclusion of measures identifying proactive employees in their hiring processes.

424  Poster #27  3:00 pm-4:45 pm
Roles of Women in Military Recruiting Posters
Sandra Kirkwood, Anthropology (M)
Ramona Perez, Anthropology
Recruiting posters outline ideal candidates and the types of jobs available to recruits. One could explore this observation through many lenses, considering technology, the types of war, or desegregation. I explore it through gender. If military recruiting posters reflect the opportunities for women in the military, then the roles of women in the posters change as women’s prospects in the armed services expand. Women’s roles in the armed forces have changed drastically over the last century. Until the 20th century, women serving in war were generally limited to unofficial roles as nurses and camp followers. From World War I (WWI) to Operation Enduring Freedom (OEF), women moved from unofficial roles to auxiliary positions and finally to more inclusive, active ones. With this move, I expect recruiting posters to directly recruit women, depict men and women working together, show women in positions of authority, move towards gender-neutrality, and acknowledge women’s ability to serve while also being a parent. If the recruitment posters, however, are consistent over time from WWI through to the present regarding symbols, composition, and roles of women, then recruitment posters may not reflect women’s current status in the armed forces. I evaluated recruitment posters with visual and propaganda analyses, exploring compositional vectors, target audience, purpose, focus of appeal, and dominant strategy. During WWI, recruiting posters used women as objects of desire or as depictions of Lady Liberty. Women served during WWI but with no rank and little authority. In World War II, women were directly recruited with posters, and official, auxiliary women’s corps was established for each military branch. Women held ranks but could only exercise authority over other women. The recruiting posters called for women to free men for the frontlines. Veteran status and access to care were major obstacles. As women earned more rights, recruiting posters started to show women in positions of authority, men and women working together, and use of more gender-neutral terms. These advances are relatively recent and are inconsistent among the branches. These variations are most likely due to legislative limitations on women to perform certain military missions.

Session D-16
Poster: Social Psychology
Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

425  Poster #28  3:00 pm-4:45 pm
Are Optimists Better or Worse at Reading Relationships? A Test of Two Hypotheses
Julia Bussberg, Psychology (U)
David Armor, Psychology
The present research tested two contradictory hypotheses about the adaptiveness of optimism in the context of romantic relationships. According to the “optimism-is-blind” hypothesis, being optimistic leads people to see the best side of even
bad situations, which may lead them to persist in the worst of circumstances, including bad relationships. On the other hand, the “optimism-is-adaptive” hypothesis suggests that optimism may be more functional and adaptive, and optimistic expectations may lead people to more quickly disengage from unfavorable circumstances, including unfavorable relationships. The goal of the present studies was to examine whether optimists are inclined to see both good and bad relationship situations more positively, which would be predicted by the “optimism-is-blind” hypothesis, or whether they are in fact better able to distinguish between good and bad situations, which would be predicted by the “optimism-is-adaptive” hypothesis. In two studies, participants evaluated whether 36 empirically-derived situations represented good, bad, or neutral signs for romantic relationships. In Study 1 (n=120), general optimism and relationship optimism were each measured with single items. In Study 2 (n = 240), general optimism was measured with the Life Orientation Test (LOT-R, Scheier, Carver, & Bridges, 1994) and relationship optimism was measured with the Measure of Expectations for Partner (MEP, McNulty & Karney, 2004). The results revealed two principal findings. First, in both studies, participants were able to distinguish positive signs of romantic relationships from negative signs, thereby validating the relationships situations measure. Second, results from both studies clearly reject the “optimism-is-blind” hypothesis and favor the “optimism-is-adaptive” hypothesis. Across studies, optimists perceived positive situations as more positive than did pessimists ($r = 0.26, p < .01$ for Study 1; $r = .16, p = .08$ for Study 2). More importantly, in neither study did optimists evaluate negative situations as less negative. In fact, in Study 2, optimists perceived negative situations as more negative than did pessimists ($r = -.20, p < .01$). Together, these results suggest that optimists might pay more attention to relationship-threatening information, not less. Implications for the adaptiveness of positive beliefs in the context of romantic relationships are discussed.

426 Poster #29 3:00 pm-4:45 pm
The Effect of Commuting Time, Personality Type, Gender and Age on Anxiety Levels
Mary Anne Olmedo, Psychology (U)
Richard Graf, Psychology
According to the Anxiety and Depression Association of America (2012), anxiety disorders are one of the most common mental health problems on college campuses. Anxiety is negatively correlated with student’s academic performance (Owens, Stevenson, & Hadwin, 2012). Research has found that programs targeting a reduction in anxiety can decrease symptoms, improving academic performance (Owens et al, 2012). In order to further develop effective coping strategies and stress-reducing programs, the purpose of the current research is to study potential factors that may contribute to anxiety among college students. The current study examined the effects of gender, personality type, age, grade level and commute time on anxiety levels of college students. We administered a voluntary self-report survey to 205 students. We hypothesized the following main effects: females would report higher anxiety than male students, anxiety would be greater among Type A students compared to Type B personality students, older students would report higher anxieties, students in higher grade levels would report more anxiety and students with a long commute would report higher anxiety than would students with a short commute. We hypothesized that among students with a long commute, females would have more anxiety than would male students. We also hypothesized the difference in anxiety between a long and short commute will be greater for Type A personality students than for Type B personality students. Consistent with our predictions, higher anxiety were reported among students with a long commute than with a short commute, females reported higher anxiety than did male students, younger students had higher levels of stress along with students in lower grade levels and higher anxiety was reported among students with Type A personality than with Type B personality. Furthermore, among students with a long commute, female students reported more anxiety than did male students. However, counter to our hypotheses, the difference in anxiety between a long commute and a short commute was greater for Type B personality students than for Type A personality students. These results allow colleges to better target the students more susceptible to anxiety and highlight the importance of implementing effective stress-coping strategies to college students.

427 Poster #30 3:00 pm-4:45 pm
What Your Friendships Say About You: Having Interracial Friendship Networks May Boost Positive Social Perceptions
Michelle Manning, Psychology (U)
David Marx, Psychology
Previous research suggests that students with interracial friendships may be judged more positively than students with same-race friendships (Weisz, Ko, Marx, & McDonald, 2013). The purpose of the current study was to examine further how social perceptions of Black and White students may vary as a function of the racial composition of their friendship network. In the current study, participants made judgments about a Black or White male target who had a friendship network that consisted of: friends of his own race (same-race), friends who were mostly from one other racial group (e.g., a White target with mostly Black friends; cross-race), or friends that were “racially diverse” (multiracial). We predicted that it would be seen as less prototypical for a White student to have a multiracial friendship network compared to a Black student, and that a White student would be perceived as having more difficulty achieving a multiracial friendship network relative to a Black student. Moreover, we hypothesized that both Black and White students
would be perceived as being more embracing of cultural diversity, less prejudiced, and less endorsing of traditional values when they had an interracial (i.e., multiracial or cross-race) as opposed to same-race friendship network. We found mixed support for these hypotheses. Specifically, we found no differences between how prototypical it was for White and Black students to have a multiracial friendship network. Counter to our hypotheses, we found that a Black student was perceived as having more difficulty achieving a multiracial friendship network than a White student. However, consistent with our predictions, Black and White students were both perceived to be more embracing of cultural diversity, less prejudiced, and less endorsing of traditional values when they had an interracial as opposed to same-race friendship network. Conceptually replicating past work (Weisz et al., 2013), these findings suggest that students may be seen more positively when they show a commitment to befriending people from racial groups that are different than their own.

**428** Poster #31 3:00 pm-4:45 pm

**Enhancing Optimism with Cost-Benefit Analyses**

Allison White, Psychology (U)
David Armor, Psychology

Previous literature has indicated that optimism can lead to many positive health outcomes, which has prompted investigation into the ways in which optimism might be increased. Additional research has illustrated that people believe that they should be more optimistic across a number of situations, than they would be if those situations actually occurred. Past inquiries regarding optimism resulted in the hypothesis that people exhibit greater optimism across situations if they have previously considered the costs and benefits of optimism, pessimism, and accuracy in each situation. To test this hypothesis, 478 adult participants at San Diego State University completed one of 24 randomly-assigned survey variations. Participants in the control conditions either indicated how optimistic they would be (described optimism) or how optimistic they should be (prescribed optimism) in thirty situations, whereas participants in the manipulation conditions considered the costs and benefits of optimism, pessimism, and accuracy before issuing a final judgment of described or prescribed optimism in ten situations. Data analysis validates previous findings in that, across all conditions and situations, participants on average indicated greater optimism when prescribing optimism, than when describing optimism. The data analysis also illustrates evidence for the current hypothesis in that participants who completed a cost-benefit analysis on average described or prescribed greater optimism respectively, than participants who described or prescribed judgments of optimism without previously considering costs and benefits. In short, people believe that they should have greater optimism than they would across situations in reality, but analyzing the costs and benefits of optimism, pessimism, and accuracy immediately before describing or prescribing optimism, leads people to believe that they should be and would be more optimistic than those people who have not participated in a cost-benefit analysis. Future studies may explore the longitudinal effects of cost-benefit analyses on participants’ situational optimism.

**429** Poster #32 3:00 pm-4:45 pm

**LGB friends reduces internal conflict with sexual minorities through controllability**

Janelle Shaffer, Psychology (U)
Allison Vaughn, Psychology

The increasing visibility and representativeness of lesbian, gay, and bisexual (LGB) individuals in social and political arenas poses the question as to how contact with the LGB community affects their integration into historically heteronormative society. Intergroup Contact Theory posits that when a majority group comes in contact with a minority group, perspective taking can occur leading to prejudice reduction. Previous research across a variety of samples shows that heterosexuals who have close friends and/or frequent association with lesbians or gay men also have more favorable attitudes toward the LGB community compared to heterosexual people who have little or no contact with lesbians or gay men. This literature suggests that intergroup contact reduces prejudice by enhancing knowledge about the out-group, reducing anxiety about intergroup contact and increasing empathy and perspective taking. We believe that Attribution Theory may help explain how contact with LGB individuals reduces internal conflict (e.g., anxiety) about heterosexuals’ attitudes and affective responses toward the LGB community. The goal of the current study was to test this relationship using mediation analyses. Participants were 435 heterosexual undergraduate psychology students (77% women; average age = 18.9 yrs.) who completed an online survey for partial course credit. The online survey assessed beliefs about the causal dimensions of sexual orientation and heterosexuals’ attitudes and affective responses toward LGB individuals. Results showed that in general, having a lesbian, gay, or bisexual friend was related to lower internal conflict toward LGB individuals. Furthermore, contact with lesbian, gay, and bisexual friends was also related to the belief that sexual orientation is uncontrollable. Finally, a formal test of mediation showed that the perception of controllability of sexual orientation mediated the relationship between contact with lesbian, gay, and bisexual friends and internal conflict toward LGB. These patterns did not hold for contact with LGB family members or school peers highlighting the complexity and nuanced nature of friendships (specifically) and intergroup contact (broadly).
The effects of vitamin D on stress in a rat model of fetal alcohol spectrum disorders

Andy Ngo, Psychology (U)
Jennifer Thomas, Psychology

Alcohol exposure can disrupt fetal development resulting in facial dysmorphology, growth deficiency, and behavioral alterations. These disruptions are known as fetal alcohol spectrum disorders (FASD). Developmental alcohol exposure affects multiple brain systems including the amygdala and the hypothalamic-pituitary-adrenal axis, both of which are involved with emotional processing. Nutritional supplements that might protect against alcohol’s damaging effects on the fetus, and serve as relatively safe and effective interventions for FASD, are now being explored. For example, vitamin D can be neuroprotective against a variety of insults, increasing release of neurochemicals that promote neuronal survival and growth. In fact, our previous work illustrates that vitamin D administration can attenuate deficits in motor coordination and learning associated with developmental alcohol exposure. The present study examines whether vitamin D can impact ethanol’s effects on stress and emotional systems. To test our hypothesis, Sprague-Dawley rats were randomly assigned to alcohol-exposed or control groups. Alcohol-exposed subjects received 5.25 g/kg/day ethanol (EtOH) from postnatal days 4 to 9 (a period of brain development equivalent to the 3rd trimester) via intragastric intubation, whereas control animals received sham intubations. On postnatal day 64, subjects were tested on an elevated plus maze, a task that can be used to measure anxiety levels. Male EtOH subjects tended to exhibit less anxiety, as measured by fewer entries into closed arms (which are preferred during stress), and this effect was attenuated with vitamin D. However, neither developmental alcohol exposure nor vitamin D had robust effects on emotional behaviors. These data suggest that alcohol exposure during the 3rd trimester does not robustly affect anxiety levels. Instead, alcohol exposure earlier in development may have a more severe impact on stress responses. Therefore, follow-up studies are needed to determine if vitamin D can ameliorate alcohol’s effects on emotional systems during earlier periods of development. It is important to identify the range of behavioral domains that can be improved with vitamin D supplementation; this information is critical as nutritional interventions are now being studied in clinical populations. Funded by National Institute on Alcohol Abuse and Alcoholism (AA12446) to JDT, ABMRF/The Foundation for Alcohol Research to NMI.
that choline mitigates ethanol's effects on some cholinergic muscarinic receptor subtypes within the hippocampus. This study examined the effects of ethanol and choline on nicotinic α7 and non-α7 receptors throughout the forebrain. Sprague-Dawley rats received binge-like ethanol (5.25 g/kg/day) or sham intubations from postnatal days (PD) 4-9, a period of development equivalent to the third trimester, and choline (100 mg/kg/day, s.c.) or saline from PD 10-30. On PD 38, quantitative autoradiography was used to measure cholinergic receptor densities. Alcohol significantly reduced α7 receptor densities in the medial prefrontal cortex (mPFC), the amygdala, and dorsal hippocampus. Choline supplementation attenuated some of these effects, although receptor densities were still lower than those of controls. In contrast, alcohol exposure significantly increased non-α7 receptor densities in the mPFC. Choline mitigated this effect, reducing receptor densities to control levels. Choline had no significant effect on nicotinic receptor densities in any brain region examined among the controls. Alcohol-induced alterations in cholinergic functioning likely contribute to the cognitive impairments caused by developmental alcohol exposure. These results suggest that choline supplementation may serve as an effective treatment for FASD, in part, by altering ethanol's action on cholinergic development and functioning. Supported by NIAAA 012446 and the Kaplan Postdoctoral Fellowship from the Department of Psychology, SDSU.

433 Poster #36 3:00 pm-4:45 pm

The Influence of Extrinsic Reinforcement on Executive Attention in Children with Prenatal Alcohol Exposure

Diana Graham, Psychology (M)
Sarah Mattson, Psychology

Children with prenatal alcohol exposure have demonstrated slower response times (RTs) on continuous performance tasks, indicating attention difficulties and sluggish cognitive tempo. This may undermine motivation to learn new tasks and relate to poorer academic success. Understanding the impact of extrinsic reinforcement during executive attention tasks may provide a strategy for mitigating attention deficits.

Three groups of children (8-12 y) participated in this study: children with prenatal alcohol exposure (AE, n=25), children with attention-deficit/hyperactivity disorder (ADHD, n=19), and typically developing controls (CON, n=29). Subjects completed a flanker task with four conditions. Dependent on condition, the task presented rewards and/or response costs (losing previously earned reward). Conditions included: (1) no reward (NR), (2) only reward (REW), (3) reward with occasional response cost (ROR), and (4) equal probability of reward and response cost (EO). Subjects responded to a center arrow (target) by pressing the button (left or right) that indicated the direction the target was pointing. Targets were presented with congruent or incongruent flanker arrows, neutral (rectangular) flankers, or alone. The variable of interest was RTs (msec) for each condition.

A 3(Group)× 4(Condition) repeated-measures ANOVA revealed a significant two-way interaction (Group×Condition, p = .006). Within-group comparisons demonstrated slower RTs in AE and ADHD for NR compared to other conditions (p < .001), which did not differ from each other (p > .631). CON showed significantly slower RTs in NR compared to all other conditions (p < .001), as well as in REW compared to ROR (p = .028) and EO (p = .050). Between-group analyses showed AE was significantly slower than CON on all conditions (p < .033) and differed from ADHD on NR (p = .011), but no other conditions (p > .153). ADHD did not differ from CON on any condition (p > .224).

Alcohol-exposed children displayed the slowest responses, although they showed a similar pattern to ADHD in that RTs significantly improved when reward was introduced, while type of reinforcement did not influence RT. This suggests that extrinsic reinforcement may effectively improve motivation in alcohol-exposed children during learning tasks that require extended attention, with possible improvement in academic settings. Additional studies are necessary to determine the long-term effects of reinforcement learning on overall performance. Research supported by NIAAA grant AA019605.

434 Poster #37 3:00 pm-4:45 pm

Testing the Invariance of Adolescent Survey-Based Smoking-Related Behaviors Across Ethnic Groups and Gender

Darius Dawson, Psychology (M)
Elizabeth Klonoff, Psychology

Tobacco-related cognitions and behaviors are often examined using national and state surveys assessing participants’ self report of attitudes and actions. However, few studies have examined the psychometric properties and the factorial invariance of various tobacco-related behaviors across ethnic group and gender. The present study examined the factor structure of 3 smoking-related items (“Have you ever smoked a cigarette?”, “In the past 30 days, how many days did you smoke cigarettes?”, “In the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?”) administered as part of the 2009 California Health Interview Survey (CHIS–adolescent version). Factorial invariance was examined across Asian Americans (N = 377), Caucasians (N = 1739), African-Americans (N = 115), and Latino Americans (N = 814). Invariance was also examined across young men (N = 1612) and women (N = 1767). It was expected that the “smoking-related behavior” latent variable that is comprised by the 3 observed variables would be invariant across both ethnic and gender groups. However, while all the baseline models were a good fit to the data (all factor loadings were significant: p <
.001), only one of the metric invariance models (Latino Americans v. African Americans) was a good fit to the data (factor loadings for all observed variables were not significantly different: $p > .05$). Factorial invariance analyses revealed all minority ethnic groups to be significantly different ($p < .05$) from Caucasians. The analyses also found young men to differ significantly from young women. These findings suggest that the types of smoking behaviors that are assessed in the CHIS do not predict the “smoking related behavior” latent variable uniformly across groups. These findings accentuate the significance of evaluating psychometric properties of scales assessing tobacco-related cognitions and behaviors generalized across ethnic and gender groups. 

**Session D-18**

**Poster: Microbiology IV**

**Friday, March 8, 2013, 3:00 pm – 4:45 pm**

**Location: Library Dome**

166  **Poster #38  3:00 pm-4:45 pm**

*Characterization of Intracellular Trafficking by Streptococcus agalactiae*

Yvette Del Rosario, Microbiology (M)

Kelly Doran, Biology

*Streptococcus agalactiae* (Group B Streptococcus, GBS) is an important neonatal pathogen because of its ability to cross the blood brain barrier (BBB) to cause meningitis. Previous results have demonstrated that GBS can directly enter and transcytose the cells that constitute the BBB in order to enter the brain; however, the exact mechanisms of intracellular trafficking are not known. Using electron microscopy, we show that when GBS invades brain endothelial cells, they reside in membrane-bound vesicles. This may indicate they are trafficked through the endocytic pathway, which is a host defense mechanism against intracellular pathogens. To further study how GBS is trafficked intracellularly, we engineered GBS strains to express Green Fluorescent Protein (GFP). During infection, GFP-expressing GBS was shown to co-localize with early and late endosomal markers, Rab5 and Rab7 respectively. Subsequently, approximately 40% of intracellular GBS co-localized with acidic compartments, suggesting that GBS can also resist killing by the phagolysosome. The GBS bacterial response regulator, CiaR, has been shown previously to promote intracellular survival in brain endothelium. We further demonstrate that a CiaR-deficient mutant is trafficked more readily to acidic vacuoles over time, when compared to wild-type GBS. These data suggest that GBS regulates factors to prevent bacterial trafficking to the lysosome. Future studies will focus on identifying CiaR-regulated genes that promote intracellular survival.

36  **Poster #39  3:00 pm-4:45 pm**

*Characterization of the Host Response to Helicobacter infection during progression to Gastric Cancer*

Arnika Sharma, Bioinformatics and Medical Informatics (M)

Kelly Doran, Biology

Gastric cancer is the second leading cause of cancer deaths worldwide, and in the USA mortality is higher among minority populations. The majority of human stomach tumors are associated with chronic infection with bacterial pathogen *Helicobacter pylori*. It is the highest identified risk factor for the development of gastric cancer and is thus considered a Class I Carcinogen, however, the mechanism of *Helicobacter*-induced gastric carcinogenesis is not known. Our overall goal is to identify host factors that promote cancer progression. We hypothesized that persistent activation of myeloid differentiation gene (MyD)-88 signaling by *H. pylori* during chronic inflammation contributes to gastric carcinogenesis. To address this hypothesis, an infectious mouse model of gastric cancer was used to investigate the global changes in host gene expression during the course of *Helicobacter* infection of wild type (WT) and MyD88 deficient mice over the course of six and twelve months. To analyze the gene expression dataset statistical and bioinformatics tools were used. We found a high number of differentially regulated genes during infection in MyD88 KO mice as compared to WT mice. Among the top 50 highly induced genes included those involved in tissue remodeling, repair, wound healing, and cytoskeletal properties. Our data suggest that tissue remodeling with chronic inflammation may play an important role in gastric cancer development and progression. Currently we are also using quantitative RT-PCR to confirm the expression of a subset of proinflammatory mediators such as Interleukin (IL)-6, IL-1, Tumor necrosis factor (TNF) and Interferon-gamma (IFN). Further evaluation of microarray data using Gene Ontology (GO) revealed “programmed cell death” pathway, anti-apoptosis and angiogenesis. Continued bioinformatics analysis will increase our understanding of *Helicobacter*-induced cancer progression and may help inform the development of preventative therapies.

37  **Poster #40  3:00 pm-4:45 pm**

*Presence of the Phage-Encoded Antibiotic Resistant Gene, blaCTX-M1, in Wastewater, River, and Estuarine Samples Collected near the US-Mexico Border*

Marley Hilleger, Microbiology (U)

Stanley Maloy, College of Sciences

Since the discovery of antibiotics, the increased use of them worldwide has been coupled with an increased presence of antibiotic resistant bacteria present in clinical, community, and environmental settings. Over two-thirds of antibiotics administered are β-lactams, providing the selection pressure for most bacteria to gain resistance by acquiring β-lactamase.
ABSTRACTS

**Poster #42 3:00 pm-4:45 pm**

**Examining double-strand break repair in vivo**

Sean Young, Biology (U)

Anca Segall, Biology

Homologous recombination is a universal biological mechanism that processes and repairs double strand breaks in DNA by using an intact sister chromatid to repair a broken chromatid. This repair process is an error-free mechanism of fixing DNA breaks induced by radiation, chemical mutagens, reactive metabolites of oxygen and nitrogen, and other harmful agents that cells are exposed to hundreds of thousands of times per day. In bacteria, the exonucleases RecJ and RecBCD initiate the homologous recombination pathway, preparing substrates for the strand exchange protein RecA. RecA generates essential 4-way intermediates that are, however, toxic if they are not removed by the RuvC protein and other proteins. While the exonucleases are essential for maintaining the integrity of DNA, they also paradoxically degrade DNA during initiation. Thus DNA repair and DNA degradation are alternate fates during the processing of ends in vivo. To investigate recombination mechanisms in cells, we developed a physical enzyme assay to examine and quantify the activities of nucleases that repair double strand breaks. We induced breaks by the controlled expression of the homing endonuclease I-Ceu I at seven highly specific recognition sequences in the *E. coli* MG1655 genome. *E. coli* strains constructed to lack the RecA, RecB, RecJ or RuvC enzymes were grown to exponential or stationary growth phase and the digested fragments were separated using pulse field gel electrophoresis. Using the location of the I-Ceu I induced breaks the predicted fragments were identified for each mutant. The extent of digestion and DNA degradation was determined by fitting the observed distribution of fragment lengths to a linear combination of Gaussian basis vectors found using fminsearch in MATLAB. Our results showed that DNA processing occurs at much higher rates during exponential growth phase and that chromosomes in stationary phase are more susceptible to I-Ceu I digestion. Our results agree with previous data that RecBCD is the primary nuclease for processing double strand breaks. In addition, we found that DNA fragments at some

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**Poster #41 3:00 pm-4:45 pm**

**Validating artificial neural networks that predict bacteriophage holin proteins**

Casey Cruz, Biology (U)

Anca Segall, Biology

Over 100,000 viral protein sequences have been identified. However, the majority of these amino acid sequences have no known function and show little sequence similarity to genes with characterized functions. Holins are small phage proteins that insert into the cytoplasmic membrane of bacteria and are required for the lysis of the host to allow newly assembled virions to escape.

Three different families of Artificial Neural Networks (ANNs) were developed to identify holins using amino acid frequency and isoelectric point as one set of inputs, the TransMembrane Hidden Markov Model (TMHMM) as a second set of inputs, and a combination of all three variables as the third set of inputs. The top 5-15 predicted holins from each ANN were synthesized and cloned. Expression of these genes will be induced in *E. coli* to test the holin function of the genes; if the proteins indeed act as holins, they will disrupt the membrane potential of the host and cause cell lysis. The function of these predicted holin genes will also be verified by testing their ability to complement the growth of a mutant lambda prophage that does not encode its own holin. This study aims to experimentally validate the accuracy with which ANNs predict the function of viral proteins based on variables other than bioinformatic sequence alignments.
locations in the genome are more susceptible to degradation than others. Our results also show that I-Ceu I and RNA polymerase compete for access to the ribosomal RNA operons in exponential phase, when these genes are highly transcribed. In summary, our assay is effective at investigating the integration of recombination-dependent repair with chromosome structure.

440 Poster #43 3:00 pm-4:45 pm

*Elucidating the role of Hepatitis C Virus NS2 and NS4A cofactors on the activity of NS3 protease*

Plamena Silvieva, Cell/Molecular Biology (M)
Roland Wolkomicz, Biology

Hepatitis C Virus (HCV) is the most common chronic blood-borne infection in the United States and is the main cause for liver cancer worldwide. The non-specific treatment available, together with the two protease inhibitors recently approved by the FDA, are expensive, toxic and only effective for certain patients. Therefore, a better understanding of the HCV life cycle is essential for developing novel drug compounds exhibiting higher efficacy and better tolerance.

HCV belongs to the *Flaviviridae* family which is an enveloped, single stranded (+) sense RNA virus encoding a single polyprotein. The main viral NS3 protease processes the non-structural (NS) region of HCV in conjunction with the NS2 and NS4A cofactors, an essential step for particle assembly. Several studies have been aimed at understanding the substrate requirement for polyprotein processing by NS3, but the role of cofactors and their mechanism of action remain elusive.

In our laboratory we are utilizing our Gal4 tetracycline-inducible cell-based assay previously adapted for HIV protease, for the monitoring of NS3 activity in hepatocytes; the natural milieu of HCV infection. To elucidate the role of NS2 and NS4A in the viral life cycle, we exploit the power of flow cytometry, where GFP expression serves as biosensor for NS3 activity. We have produced NS2, NS3, and NS4A with wild type and mutated cleavage sites, to test in cis as well as in trans, the cleavage activity within the assay. The subcellular localization of the various forms of NS3 and NS3/4A expressed in hepatocytes was investigated by indirect immunofluorescence and confocal laser scanning microscopy. We have observed that full length and various forms of NS3 were found in a diffused cytoplasmic and nuclear localization. In contrast, NS3/4A was found to be localized in the ER. These results demonstrate the importance of studying HCV proteins in their biological context. To further elucidate the role of NS2/3/4A we are analyzing their effect on signaling cascades using PhosphoFlow, a technique that allows detection of phosphorylation events through intracellular staining. PhosphoFlow coupled with a cell-based assay can greatly facilitate the study of the viral cofactors on the HCV viral life cycle.

Session D-19

**Poster: Microbial Ecology**

Friday, March 8, 2013, 3:00 pm – 4:45 pm
Location: Library Dome

441 Poster #44 3:00 pm-4:45 pm

*High Variability and Low Site Specific Microbial Communities Occur on Black Tip Reef Sharks (Carcharinus melanopterus) in the Southern Line Islands*

Michael Doane, Biology (M)
Elizabeth Dinsdale, Biology

Recent research has found that microbial community compositions reflect the health of the coral reef system on which they are found. Many benthic organisms found on reefs, including coral and algal species, display distinct microbial communities. We hypothesize those site-specific, top predators, such as sharks will follow a similar trend. The aim of this study is to extend the concept of the coral holobiont to higher trophic levels, with characterization of the microbial communities associated with apex predators. On four coral atolls in the Southern Line Islands (central Pacific), two Black Tip Reef sharks (*Carcharinus melanopterus*) from each atoll were caught and samples were collected for metagenomic analysis. The microbes were “supersucked” from the undersides of the sharks, after which the sharks were released, unharmed. The DNA from the microbes was extracted and the metagenomes were sequenced with Roche 454 technology with titanium chemistry.

The MG-RAST platform was used to assess the taxonomic and functional composition of the metagenomes. Bacterial species had high variability on the surface of each individual shark; therefore, low site specificity was observed. Similarly, metabolic potential of each shark metagenome showed highly variable results and low site specificity. Carbohydrate and cell signaling metabolism showed great variability between each shark. Sharks on coral reefs may not harbor a specific microbial community, unlike many benthic organisms on coral reefs which have been found to have a species-specific microbial community. Analysis of variance using Shannon Diversity reveals high variance of microbial species on sharks nested in the same site and between sites. Hydrodynamic properties of shark skin reduce drag, which may inhibit microbial growth. The high variability in the data, suggest that only microbes with opportunistic abilities to cling to the shark skin surface flourish and that these microbes vary between individual sharks from each reef.
**ABSTRACTS**

**Sequencing and Annotating the California Sea Lion Genome**

Sowmya Chinta, BMI (M)
Elizabeth Dinsdale, Biology

*Zalophus californianus*, the California sea lion, is a coastal sea lion that ranges along the west coast of USA, from Alaska in the north to the Baja Mexico, in the south. Sea lions are well-known for their playfulness, intelligence, and are used in the military and wildlife shows, making them a charismatic organism for students to investigate. Because genomic analysis is becoming an important tool in the life sciences, undergraduate students need to learn how to sequence and annotate DNA. In 2010, a new class was developed where students gained hands on experience in preparing DNA samples to operate sequencer and the analysis and annotation of the genome. Sequencing the sea lion genome provided experience in researching a large genome and the identification of genes that are responsible for specific traits, such as the evolution of a land mammal to semi-aquatic habitat. The Sea lion genome was sequenced using a 454 FLx sequencer, provided through collaboration with Roche 454 Lifesciences, and the resultant data was assembled using Newbler version 2.3. Interspersed repeats and low complexity DNA were identified and masked using Repeatmasker. Prediction of gene structure and compositional features of exons, introns and intergenic regions was conducted by a general probabilistic model called GENSCAN. Functional annotation was carried out by comprehensive bioinformatics tool called Blast2GO. The Basic Local Alignment Search Tool (BLAST) was used to find regions of local similarity between sequences and to infer functional and evolutionary relationships. At total of 24 billion bp of sea lion DNA was sequenced and 1.3 million contigs were generated. The proportion of repeat regions within the sea lion genome was 34.7%, and dominated by the LINE category, similar to other carnivores. A Blast search of the mitochondrial DNA generated by the students showed a 100% match to the mitochondria of the California sea lion from NCBI. Our initial analysis shows that the undergraduates are providing a high quality genomic dataset that can be used to teach genomics and for researchers interested in genomic variations of marine mammals.

**Biogeochemical and microbiological niche space of Hydra spp. in San Diego County**

Mark Little, Biology (U)
Forest Rohwer, Biology

*Hydra* spp. are one of the oldest and best studied model animals, however its ecology is much less well known. Here we describe the natural history of *Hydra* spp. in San Diego County using a combination of field surveys and laboratory incubations. Field capture surveys showed that *Hydra* spp. abundances varied throughout the year, with the highest abundance in July through November. This correlates with locals lows in rainfall and highest annual temperatures. Budding measurements in the lab showed that rates were higher at lower temperatures, suggesting that increased “birth rates” were stimulated by temperature and were not responsible for the increased capture rates. We hypothesized that death rates were higher with annual rates of rainfall. We tested a number of factors that might be responsible, including salinity, pH, nutrient runoff, and dissolved organic carbon. No significant differences in pH, dissolved oxygen (mg/L), and temperature (°C) were found amongst the sites where *Hydra* spp. were found. Two species were identified in our sites in San Diego County, and include the green hydra (*Hydra viridissima*), and the brown hydra, *Hydra vulgaris*. Similarly, there was no significant correlation with these geochemical measurements and the presence of green versus brown hydra. Although, the only site where the green hydra were found, *H. viridissima*, exhibited a significantly lower pH level than all sites where brown hydra were found. Experiments with different levels of organic carbon and nutrient additions revealed some slight variation in toleration levels between the two species investigated.

**Statistical Analysis of Metagenomes in Marine Environments**

Horacio Lopez, Mathematics (U)
Imre Tuba, Mathematics

Metagenomes are genetic material from environmental samples of microbial communities. Metagenomics is the study of metagenomes which can be encoded and analyzed in ways that allow researchers to study microbial environments and their metabolic processes. Through metagenomic analysis, a relation can be drawn from the processes of bacterial communities in one environment to the processes of different bacterial communities in other environments. This allows researchers to approach a new way of understanding how microbes interact and function as a collective community. Here, we propose to analyze metagenomic data from various marine environments against the pollution levels of those environments. Using several different statistical methods to analyze if and how pollution is related to the dominant metabolic processes of the microbial community samples, our results will inform our understanding of how microscopic life forms respond to environmental degradation. One potential application is the early detection of environmental stress caused by man-made pollution through statistical analysis of metagenomes in the environment.
The coral holobiont is a complex assemblage of organisms consisting of a multicellular host and associated microorganisms. However, the holobiont concept is not limited to coral; rather, the concept is expandable to benthic algae and most likely to all benthic organisms. This invokes imagery of spheres of holobionts crawling over one another as they combat for dominance over the space and resource limited benthos. While the visible multicellular macroorganism of a holobiont is contributing to the effort of controlling territory, unseen players too are exerting their influence on the micro scale. The Bacterial associates of a holobiont are some of the most diverse members, contributing many functions to support the health and resilience of the whole. It is important then to identify and study how bacterial members of a holobiont are structured by the host and the environment. Here, core and satellite bacteria of two coral and two algal holobionts are distinguished, and the impact of spatial separation along a natural gradient of environmental parameters on shaping these bacterial communities is assessed.

Session E-1

445 Poster #48 3:00 pm-4:45 pm

Delineation of Core and Satellite Bacteria Associated with Coral and Algal Hosts

Eric Hester, Microbiology (U)
Forest Rohwer, Biology

The coral holobiont is a complex assemblage of organisms consisting of a multicellular host and associated microorganisms. However, the holobiont concept is not limited to coral; rather, the concept is expandable to benthic algae and most likely to all benthic organisms. This invokes imagery of spheres of holobionts crawling over one another as they combat for dominance over the space and resource limited benthos. While the visible multicellular macroorganism of a holobiont is contributing to the effort of controlling territory, unseen players too are exerting their influence on the micro scale. The Bacterial associates of a holobiont are some of the most diverse members, contributing many functions to support the health and resilience of the whole. It is important then to identify and study how bacterial members of a holobiont are structured by the host and the environment. Here, core and satellite bacteria of two coral and two algal holobionts are distinguished, and the impact of spatial separation along a natural gradient of environmental parameters on shaping these bacterial communities is assessed.

446 9:00 am

Restorative Practices in the homes of Spanish speaking parents

Daniel Ramirez, Education (M)
Colette Ingraham, Education

The purpose of this study is to gather data on the efficacy of restorative practices to help improve healthy school climates and positive home environments. The present study is part of a larger community project (Ingraham, Monk & Hokoda, 2010) carried out at Cherokee Point Elementary School within San Diego Unified School District. The goal is to inform participants on the purpose of restorative practices while training them to participate in the process. The study is focused on a Participatory Culture-Specific Intervention Model (PCSIM) in which key stakeholders are actively involved throughout the planning, development, and implementation of the intervention. A significant characteristic of PCSIM, is its emphasis on culture sensitive interventions which are understanding of participants culture, language, values, and beliefs (Natasi, Moore, & Varjas, 2004). The study concentrates on cultural factors within a West City Heights community that is made up primarily of ethnic minorities, the largest population being Mexican-Americans. Currently, there is a lack of research surrounding the use of restorative practices with culturally and linguistically diverse communities, especially with parents who are English learners, along with the use of restorative practices with English learner parents. The use of PCSIM allows for a unique measure of research, one in that is recursive, active and purposeful (Natasi, et. Al., 2004). This methodology is particularly well suited for targeted participants (parents and community members). A mixed methods designed is used with both quantitative and qualitative data. A needs assessment reveals three areas of need in resolving home conflicts. The intervention is developed on results of a needs assessment, and both quantitative and qualitative results will be reported. The intervention is conducted in Spanish language and process delivery to match participants; however, English language was also used in a smaller group for non-Spanish speakers. Additionally, the intervention involves a five-step process and takes place over the course of one school semester. We expect to improve interpersonal relationships in school, which will lead to a positive environment for learning. Infusing cultural values of a community when dealing with school issues leads to culturally inclusive solutions that benefit educational professionals, students, and parents.

447 9:15 am

Effects of Hair Combing Interaction Support Groups on Caregiver and Child Attachment

Kathleen Baca, Community Based Block (M)
Nola Butler-Byrd, Counseling and School Psychology

Academic and health outcomes continue to be poor for many students of African, African American, Latino, Southeast Asian and Native American descent. Elementary and Middle school are critical turning points for many students academically and socially. Attachment, or emotional attunement is a key component of adolescent well-being and academic success. Interventions are needed that improve caregiver/child attachment relationships in order to help children develop healthy attachments in school with teachers and peers. This study will replicate research by Lewis (1999) that used hair combing as an intervention between African American female caregivers and their children to assess and improve attachment between students and their caregivers. Caregiver/child pairs will be recruited at elementary and middle schools and community-based sites in the San Diego area, including the Monarch School where the initial implementation of this study will occur. This study will extend this research to examine interactions between male caregivers and their children and caregivers from other marginalized non-African American cultural groups. Mixed methods will be used, including in-person demographic, and psychological questionnaires, a non-invasive assessment of heart rate.
variability, and videotaped interviews. Inferential statistics and
narrative analyses will be used to examine data collected in this
study. Potential risks will be minimal. The findings from this
study will be used to develop culturally responsive attachment
curricula for caregivers and children from marginalized groups
designed to promote their well-being and academic achievement.

448 9:30 am

Empowering Spanish Speaking Parents: A Workshop on
Academic Home Involvement
Jessica Gutierrez, School Psychology (M)
Colette Ingraham, Education

Parent engagement is a critical component to increase student
academic achievement (Esler, Godber, & Christenson, 2008; Hill
& Taylor, 2004) and it is one of the most pertinent needs in the
United States education system. Yet, there are few models for
educators in working across languages to reach diverse parent
communities. This is especially relevant for Spanish speaking
parents as more than half of the United States population growth
between 2000 and 2010 was due to the increase in the Latino
population (U.S Census, 2010). The Participation Culture-Specific
Intervention Model (PCSIM) (Nastasi, et al., 2006) methodology
was utilized to co-create a parent workshop tailored to the
interests of the parents. We used the multi-step PCSIM methods
to generate parent engagement and empowerment through the
design, delivery and evaluation of the parent workshop. Using the
recommendations in Ingraham and Oka (2006), we worked with
cultural brokers and collected data to transport evidence-based
interventions to a new setting. We conducted a series of ongoing
needs assessments during school-community meetings with par-
ents and educators to identify opportunities for systemic and pro-
grammatic services, such as a parent workshop. We held these
meetings in ways that fostered high levels of parental involvement
and participation. This space was also conducive to interactions
with parents to gather input on workshop content. Both quantita-
tive and qualitative data was collected via pre and post surveys on
parents’ knowledge on how to support their children’s academic
success. Parents also provided feedback on the usefulness of the
workshop. Evidence of parent workshop outcomes was positive.
99% of the parents strongly agreed or agreed that they increased
their knowledge of strategies to help their children with home-
work. The parents’ narrative comments provided specific and
rich evidence of intervention effectiveness. Parents expressed
gratitude for presenting the workshop, in Spanish, and providing
them the space to dialogue with other parents.

449 9:45 am

Sexual Identity, Race and Resiliency Among
College Students
Aaron Iffland, SDSU/CGU Joint Ph.D. in Education (D)
Rafaela Santa Cruz, Teacher Education

All college students face some level of adversity when striving
for academic success. The levels of adversity and academic
success vary greatly from individual to individual. Some students
may face relatively little adversities in their college life, but still
fail. Others may face relatively enormous amounts of adversity,
yet still succeed. Why this occurs is not completely known.
Researchers have been using the concept of academic resilience
to better understand this problem. However, a majority of
the research assumes individuals are relatively the same
in many aspects. That is, there is no differentiation among
individuals of different race/ethnicities or sexual orientations.
The purpose of this study was to investigate the differences
in levels of resiliency among college students based on race/
ethnicity and sexual identity. The participants in this study
were a group of 120 college students at a large, public
university in California. Descriptive statistics and factorial
ANOVA were used in this study to determine the difference in
resiliency as measured by the Jew Resiliency Belief System.
From the results, it may be indicated that there are differences
in resiliency based on race/ethnicity and sexual identity.
However, an interaction of the two effects was not found.
These findings may be used to inform continued research into
race/ethnicity and sexual identity based resiliency research.
Administrators and instructors may also use these findings to
foster resiliency across race/ethnicities and sexual identities.

450 10:00 am

Restorative Practice in the Classroom
Derek Moehlenbruck, School Psychology (D)
Colette Ingraham, Education

This needs assessment survey was given to Cherokee Point
Elementary (CPE) School teachers, at least 2 teachers from
each grade (K-5th) level, with a total of 17 of 24 teachers,
or 70% of teachers. In order to identify general needs in the
implementation of restorative practices in the school and as part
of the Wellness and Restorative Practice Partnership (WRPP)
domain questions focused on how to better support the teachers
in the implementation of this process. The purpose of this needs
assessment is to determine which areas teachers need support
in developing restorative practices in their classrooms when
working with their students. The data is reported and outlined
into five main areas 1) Knowledge and comfort 2) Support areas
3) Possible training needs for staff 4) Hurdles (i.e., perceptions,
barriers and cultural connectedness to the children and their
community 5) Strengths of CPE School. Information from the needs assessment, meetings with administrative staff, meetings with lead restorative practice teachers and WRPP team members were gathered to identify the most prevalent areas of needs at CPE for the implementation of Restorative Practices in the classroom. The general findings demonstrate highest needs in the following areas: 1) Modeling: need for classroom modeling support for implementing RP strategies 2) Sustainability: staff buy in with the implementation and usage of Restorative Practice. With this information, teachers will sign up for members from the WRPP team to model Restorative Practice in the classroom. They will also receive professional development workshops to support them with a deeper and more thorough understanding of restorative practices through additional modeling, role-play experience, and lessons used from Restorative Practice curriculum entitled “Discipline that Restores” by Ron Claassen. Outcomes of this study will measure an increase or decrease of measured responses using an additional needs assessment post measure.

451 10:15 am
A Comparison Study of the Professional Learning Communities in the United States and China
Ke Xu, Educational Leadership (D)
Cheryl James-Ward, Educational Leadership
The U.S. education system faces challenges from federal and state mandates, globalization, record numbers of countries outperforming the U.S. on international student exams, and the demand for students to acquire 21st century skills. To meet these challenges, professional learning communities (PLCs) have emerged as an effective practice for teachers to work collaboratively to improve teaching practices, increase student achievement, and enhance school improvement. The purpose of this study was to find the similarities and differences in implementing and sustaining successful PLCs between U.S. schools and Chinese schools as well as the lessons that could be learned from each. This qualitative study, with the tradition of phenomenology, included four participating schools in each country. In each school, one principal and four teachers participated in the study. Data collection included interviews of principals and teachers, classroom observations, and relevant documents; data were coded to allow themes to emerge. The five themes that emerged were (a) strong leadership, (b) collaborative learning culture, (c) efficient structures to support PLC activities, (d) continuous intellectual development for teachers, and (e) challenges and obstacles in functioning PLCs. The implications for teachers, principals, and policy makers provide new perspectives in understanding the phenomenon as a means to educate the 21st century learners and reform outdated institutional philosophies and traditional practices.

452 9:00 am
Stressful Life Events, and Appraisal in Individuals at Clinical High-Risk for Psychosis, First-Episode Schizophrenia and Healthy Controls
Edward Lannon, Psychology (U)
Kristin Cadenhead, Psychiatry
Background: Individuals at risk for psychosis (AR) in the first-episode of schizophrenia (FE) report significantly more undesirable stressful life events than controls (HC). However, there is limited understanding of the idiosyncrasies and appraisal of stressful life events in each group. Method: A self-report instrument, Stressful Life Events Questionnaire (SLEQ), was utilized to assess number of stressful life events, degree of coping, and personal distress. The SLEQ is composed of 113 items distributed in 11 broad areas (e.g. Work, Love, Family, Friends and Household). The items in each area can be subdivided into composites of desirability (desirable and undesirable), and dependence of mental health (dependent or independent). The SLEQ was administered to 137 participants (49 FE, 41 AR and 47 HC). Results: After controlling for age and gender, AR and FE subjects where significantly more distressed by stressful life events F(2,132) = 17.201, p < .008 (FE vs HC and AR vs HC, p = .05), independent stressful life events F(2,113) = 4.562, p = .012 (FE vs HC and AR vs HC, p < .05) and undesirable stressful life events F(2,127) = 3.918, p < .001, as well as reporting more undesirable stressful life events F(2,134) = 4.993, p = .008. Conclusion: Stress is a significant risk factor in early psychosis and an important target for early intervention.

453 9:15 am
Exercise and Nutrition Knowledge in Deaf Individuals
Laura Greathouse, Psychology (U)
Vanessa Malcarne, Georgia Sadler, Psychology
Nearly 1 in 20 Americans are deaf or hard of hearing (D&HH). Deaf individuals can be categorized into two groups: deaf (with a lowercase d) and Deaf (with an uppercase D). Members of the Deaf community tend to view themselves as a part of an ethno-linguistic minority, rather than label themselves as disabled. Relatively little research has been done on obesity as it pertains to d/Deaf individuals. This issue is important because D&HH individuals do not receive sufficient information about the risk of poor health behavior. Mainly, the D&HH cannot access information due to communication barriers. D&HH individuals have English literacy averages at third- to fourth-grade reading levels.
There are multiple health problems associated with obesity, such as heart disease, cardiovascular disease (CVD), diabetes, high blood pressure, cancer, osteoarthritis, and more. Because of the limited information on D&HH individuals’ health behavior knowledge, I aim to explore gender and age group differences in exercise and nutrition knowledge.

The Deaf community outreach team recruited a convenience sample of 202 participants, ranging from 18 to 87 years old. There were four participants who never attended school or only attended school through eighth grade and there were 67 participants who completed some college and 102 participants who graduated college.

Participants were recruited from various settings and were run through the study in different locations. Most came to the Community Outreach division at the Moores Cancer Center UCSD to complete the study. Participants completed a pre-test that included questions about exercise and nutrition, as well as demographics in a self-reported packet. Participants were then randomly assigned to two groups: exercise group or nutrition group, and then separated by age (18-24, 25-40, 40+). Each group viewed a different video that contained age-appropriate information about workout techniques and BMI.

Preliminary findings show that there are no gender differences in regards to pre-test exercise and nutrition knowledge. We found a significant difference between the three age groups when accounting for education level. Exploring exercise/ nutrition knowledge will impact incidence of CVD & other life-threatening diseases in population.

454 9:30 am

**SB 183: Carbon Monoxide Prevention Act Research Project**

Victoria Carrillo, Criminal Justice Administration (U)
Kelley Crockett, Public Administration

Senate Bill 182 (SB183) was created in 2010, and enacted in 2011, so that the State of California could prevent carbon monoxide poisoning from occurring in citizens’ homes. This safety trend has gained national attention in the past few years after hundreds of poison related hospitalizations and deaths were reported. Unfortunately, carbon monoxide exists in many dwellings designated fit for human occupancy. Statewide many buildings are affected. Many homes have gas burning appliances or have an attached garage in which gasoline odors are contained. January 1st, 2013 was the final deadline for owners of multi-family dwellings to install carbon monoxide alarms before legal action could be taken. One of the central issues of this legislation is the vague wording and implementation guidelines. Local and state government officials are challenged to find ways to implement this important but broad mandate for carbon monoxide monitor installation inside occupied private residences.

This study reviewed previous state cases dealing with overall safety standards compliance to building codes. In Camara versus Municipal Court of San Francisco (1967), it was determined that search warrants were not required in non-emergency situations like health inspections. Search warrants should normally be sought only after entry is refused. The lack of entry without legal jurisdiction, however, creates undue burdens on local authorities responsible for inspections. In Widmar versus the City of Marysville, CA (1974), the fire chief was obligated by mandatory duty, imposed by law, to comply and enforce the minimum fire safety standards. Those persons living in dwellings who were at risk of potential harm were supposed to be identified and warned.

This research also included conducting surveys with other cities and relevant business agencies. Prevention materials were also reviewed. What was found was that most cities have a limited or minimal application of SB183 through readjusted building codes or through providing a carbon-monoxide prevention website link. These findings were developed into suggested action plans that identified agencies that should be utilized for maximum implementation. Future integration of this legislation by local governments should pursue inter-agency cooperation, public service announcements, easier monitoring accessibility proposals, and carbon monoxide prevention education.

455 9:45 am

**From Dutch to Russian Disease**

Anna Ossowska-Borowik, Economics (U)
Hisham Foad, Economics

This paper examines whether Russia is sick with Dutch Disease. The main symptoms of Dutch Disease are: real exchange rate appreciation, slower manufacturing growth, faster service sector growth, and higher overall wages. Russia is one of the major natural resources producers in the world. It is estimated that Russia holds the world’s largest natural gas reserves, second-largest coal reserves, and seventh-largest oil reserves. Sixty percent of Russia’s total export revenues come from oil products and natural gas which is one fourth of Russia’s GDP. There is, however, a fear that the Russian economy is too dependent on the energy sector and not diversified enough. Current economic growth is very impressive, but it also gives some grounds for concern about its stability and endurance. High oil prices in recent years are the main source of GDP growth. These income sources are unstable and unpredictable and cannot guarantee long-term economic growth. Resource price boom leads to a real exchange rate appreciation, which then leads to a decline in manufacturing output (and/or manufacturing exports). Evidence of a causal link between prices of natural resources and appreciation of Ruble suggests the presence of Dutch Disease in Russia.
The Global Relationship between Maternal Mortality and Births Overseen by Skilled Health Workers

Raphael Cuomo, Public Health (M)
Jong-Duek Baek, Graduate School of Public Health

Hypothesis: The null hypothesis is that there is no significant global relationship between maternal mortality and percent births overseen by skilled health workers. Concordantly, the alternative hypothesis is that there is a significant global relationship between maternal mortality and percent births overseen by skilled health workers.

Methods: The hypothesis will be tested through a series of statistical and geospatial analyses. In addition to the independent variable of interest, percent births overseen by skilled health workers, the analyses will assess and control for maternal mortality’s relationships with the following variables: mothers receiving prenatal care, female contraceptive prevalence, adolescent births, percent below national poverty level, physicians per capita, and per capita health expenditure. First, bivariate relationships with maternal mortality will be tested through simple linear regression. Second, multiple linear regression models will be constructed from statistically significant bivariate associations with maternal mortality. Last, geospatial analyses will be conducted to determine the geographic locations associated with high and low levels of maternal mortality and births overseen by skilled health workers.

Results: In simple linear regression tests, all independent variables were significantly related to maternal mortality. Furthermore, bivariate modeling revealed that many countries were concentrated among low levels of maternal mortality. Multiple linear regression models revealed that prenatal care, physician prevalence, and health expenditure per capita became insignificant when additionally controlling for percent births overseen by skilled health workers, contraceptive prevalence, and adolescent birth rate. Geospatial analysis showed that maternal mortality was high in Africa and southern Asia, which were also regions where percent births overseen by skilled health workers were low. Further geospatial analysis revealed that percent births overseen by skilled health workers were high in Europe and North America, where per capita health expenditures were also high. Lastly, geospatial analysis showed that percent births overseen by skilled health workers and percent below poverty level were both high in sub-Saharan Africa and parts of Central America.

Summary: Maternal mortality is significantly associated with percent births overseen by skilled health workers, even when controlling for several covariates.
The Eye and the Hand: Visual-Haptic Interaction in Word Comprehension
Samantha Mitsven, Psychology (U)
Margaret Friend, Psychology

Direct evidence about children’s early language abilities comes from studies using haptic and visual responses to verbal prompts. Across diverse domains, infants may exhibit knowledge during a visual attention task, but fail to exhibit knowledge when it is measured haptically. Recently, Gurteen, Horne, and Erjavec (2011) suggested that reaching diverts visual attention away from a target, potentially leading to behavioral dissociations. However, this claim has never been empirically tested.

The current study used an intermodal word comprehension task; a modified combination of two well-known measures of comprehension, the looking-while-listening procedure (Fernald et al. 2006, 2008) and the Computerized Comprehension Task (Friend et al. 2003, 2008, 2011). Fifty infants (16-18 months old) were prompted to touch the target image on a touch sensitive monitor in a forced-choice task. Video cameras recorded their visual and haptic responses.

To determine whether action diverts attention away from the target as Gurteen and colleagues claimed, the proportion looks to the target pre- and post- reach onset were calculated and analyzed in a 2 (Touch type: target, distractor) X 2 (Time: before, after) ANOVA yielding significant main effects of Touch F (1,49) = 404.16, p = .00 and Time F (1,49) = 7.66, p = .01. There was also an interaction between Touch and Time F (1,49) = 198.88, p = .00, such that infants’ visual attention to the target increased on target relative to distractor-touch trials, suggesting that action focuses attention onto the touch location. To further investigate this relationship, the difference in proportion looks to the target on touch trials relative to no touch trials was analyzed. There was a main effect of touch. Infants looked longer in both target (M = .58, SD = .02) and no touch trials (M = .55, SD = .01) than in distractor touch trials (M = .41, SD = .02). There was no significant difference between the target and no touch trials.

These results suggest that action serves to focus attention on touch location. This research is important for understanding the relationship between vision and action in infants and for reconciling results obtained by tasks that differ in response modality.

The Auditory Comprehension of Who and Which-NP Questions: Which Account do the Data Support?
Shannon MacKenzie, Language and Communicative Disorders (D)
Lewis Shapiro, School of Speech, Language, Hearing Sciences

This study is the initial phase of a two-phase study investigating the online processing of Wh-questions in neurologically unimpaired adults and adults with Broca’s aphasia; this study collected data from neurologically unimpaired college-age adults. Wh-questions are interesting structures to investigate because they contain so-called long-distance dependencies. For example, the sentence “Which protestor did the sheriff push last night?” contains an NP argument (“which protestor”) that has been displaced from its typical direct object position occurring after the verb (signified by above), to an earlier position in the sentence. To understand such object-extracted wh-questions, listeners must connect the two non-adjacent positions, that is, the gap after the verb and the displaced NP. There are two general types of Who-questions: who/what (e.g., Who did the Sheriff push...”) and which-NP (above), and within those, there are subject-extracted (e.g., “Which Sheriff pushed the protestor...”) and object-extracted (see above).

Evidence from the linguistic and psycholinguistic literature suggests that Which-NP structures are more difficult to understand than Who/What-questions, and within those, that object-extracted are more difficult than subject extracted. Furthermore, people with Broca’s aphasia have particular difficulty with object-extracted Which-NP constructions relative to the others. In the current study Wh-questions were presented to healthy adult listeners while they were looking at a ‘three-figure’ picture (e.g., two protestors and a sheriff). Reaction times to resolving the question were recorded. Eye movements to the referents in the picture were also recorded, thus allowing an examination of online processing. Initial results revealed significantly more looks to the object in object-extracted questions (and more looks to the subject in subject-extracted sentences), and, importantly, that RTs to the object-extracted Which-NP questions were significantly longer than RTs to Who-question counterparts. Gaze behavior patterns, however, differed from the RT data. More gazes to object-extracted who-questions relative to subject-extracted who-questions were observed, but no significant gaze differences were found for the Which-questions. These preliminary data are discussed in terms of different accounts of Wh-question comprehension.
460  9:45 am

You can look but don’t touch: the real-time dynamics between infant visual and haptic behavior

Kristi Hendrickson, Speech, Language, and Hearing Sciences (D)
Margaret Friend, Psychology

The application of looking- and reaching-based measures as proxies for underlying cognitive abilities has a rich history in infant development research, and perhaps none more so than studies of early vocabulary comprehension. Both visual and haptic measures have long-term predictive value, though it remains unclear whether they are analogous and substitutable measures of lexical knowledge (Charles & Rivera, 2009). Additionally those who implement haptic methods are confronted with the challenge of interpreting the difference, if one exists, between representations that drive incorrect versus absent responses. Analyzing looking behavior concurrently with haptic response creates a ground for determining differences between these two response types.

We investigated the real-time dynamics between two measures of word comprehension: one visually-based (Fernald et al. 2001, 2008), and one haptically-based (Friend et al., 2003, 2008, 2012). Fifty 16-18-month-old infants were seated in front of a touch sensitive screen and prompted to touch one of two images (target). Videos of infants’ looking and haptic responses were synced and coded frame-by-frame. Visual reaction time was operationalized as mean latency to shift to the target image. Haptic response was operationalized as number of target touches.

Reaction time significantly predicted haptic response, \( F(1,49) = 7.299, p < .009 \) accounting for \(~13\%\) of the variance. To further investigate this relation, we divided trials into three haptic types (target, distractor, and no touch). There was a significant effect of trial type, \( F(2,43) = 11.98, p < .001 \) such that mean reaction time for no touch trials \((M = 1134.5, SD = 465.3)\) was significantly greater than for target \((M = 742.8, SD = 324.0)\) and distractor \((M = 903.1, SD = 309.6)\). However reaction times for target and distractor touch trials did not differ significantly.

In the current study we found that visual reaction time and haptic response are significantly related. Moreover, reaction time changes as a function of where and whether infants execute a haptic response suggesting that distractor touches reflect partial knowledge, whereas failure to touch appears to reflect an absence of knowledge. This research will help bridge the gap between different assessment approaches to measuring early language.

461 10:00 am

Cognitive factors contributing to impaired spelling performance in school age children with heavy prenatal alcohol exposure

Leila Glass, Clinical Psychology (D)
Sarah Mattson, Psychology

The adverse effects of heavy prenatal alcohol exposure on language abilities have been well documented. However, despite its clinical and academic relevance, spelling performance has not been comprehensively evaluated. We examined whether alcohol-exposed children have deficits in spelling and related abilities, and if a differential relationship between contributing cognitive factors and spelling achievement exists.

Ninety-six children (8-16y) completed the Spelling subtest from WIAT-II and NEPSY-II subtests. Children with prenatal alcohol exposure (AE, \( n = 49 \)) were compared to controls (CON, \( n = 47 \)). Group differences were evaluated using ANOVA. Correlational analyses evaluated relations between cognitive predictor variables and Spelling. To determine the contributions of Group and the predictor variables [Speeded Naming (SN), Phonological Processing (PP), Auditory Attention (AA), Working Memory (WM)] on Spelling, multiple hierarchical regressions were conducted with Group (step 1), predictors (step 2), and Group x predictor interactions (step 3). We hypothesized significant group differences on all measures (AE<CON), and group-dependent contributions of predictor variables on Spelling. Specifically, PP would demonstrate the strongest contributive association to Spelling in both groups. Compared to CON, AE was expected to show weaker associations between WM, SN, and AA and Spelling. CON was expected to show equally strong associations between WM and PP predictors and Spelling, while SN and AA would not contribute significant variance.

The groups were matched on demographic variables. Predictors were highly correlated with Spelling \((r \geq .433)\) and groups differed significantly on all measures \((p \leq .001, AE<CON)\). Step 3 of the regression was significant overall \([F(9, 93) = 11.58, p \leq .001]\), with significant main effects for Group \((p \leq .001)\), PP \((p \leq .001)\), and AA \((p = .048)\), and a significant Group x WM \((p = .014)\) interaction. Follow up demonstrated that WM significantly contributed to Spelling for AE \((p < .001)\), but not for CON \((p = .321)\). SN did not contribute significant variance.

Alcohol-exposed children demonstrated deficits in spelling and related abilities. Across groups, PP and AA contributed significantly to spelling performance. Contrary to our hypotheses, WM was an additional significant predictor of spelling achievement in AE subjects. This supports PP and AA interventions for remediation of spelling deficits, however WM should be an additional area of focus when targeting spelling deficits in alcohol-exposed children.
Session E-4
Oral Presentation: Fire and Flames
Saturday, March 9, 2013, 9:00 am
Location: Love Library 410

462 9:00 am
Wildland Firefighter Health and Safety Monitoring Methods
Monica Mares, Biology/Environmental Science (U)
Matthew Rahn, Environmental Science

Anthropogenic factors such as increased urbanization into forests and grasslands, human-caused fires, and climate change have contributed to the increase in frequency and devastating power of wildfires during recent years. Effective wildland firefighting forces are imperative in containing and limiting catastrophic and costly damage by wildfires. Firefighters face various risk factors which can have adverse effects on their health and safety. Among the most notable risks are heart problems, heat stress, and exposure to toxic smoke derivatives such as carbon monoxide, particulates and hazardous air pollutants. The effectiveness of wildfire initial attack and response decreases when health and safety of firefighters is compromised.

The purpose of this study is to analyze and recommend possible ways of assessing health and safety through the monitoring of risk factors. This is critical in order to improve firefighting response and effectiveness. The monitoring methodologies developed through our research can be tested in collaboration with CAL FIRE and CDF Firefighters within controlled fire settings in future studies aiming to improve the effectiveness of wildfire initial attack and response.

463 9:15 am
Examination of the Wildland-Urban Interface Fire Dynamics Simulator in Modeling of Laboratory-Scale Surface-to-Crown Fire Transition
Drew Castle, MSME (M)
Fletcher Miller, Mechanical Engineering

Understanding the conditions leading to the transition of fire spread from a surface fuel to an elevated (crown) fuel is critical to effective fire risk assessment and management. Surface fires that successfully transition to crown fires can be very difficult to suppress, potentially leading to damages in the natural and built environments. This is relevant to chaparral shrub lands which are common throughout parts of the Southwest U.S. and represent a significant part of the wildland urban interface. The ability of the Wildland-Urban Interface Fire Dynamic Simulator (WFDS) to model surface-to-crown fire transition was evaluated through comparison to laboratory experiments. The WFDS model is being developed by the U.S. Forest Service (USFS) and the National Institute of Standards and Technology. The experiments were conducted at the USFS Forest Fire Laboratory in Riverside, California. The experiments measured the ignition of chamise (Adenostoma fasciculatum) crown fuel held above a surface fire spreading through excelsior fuel. Cases with different crown fuel bulk densities and imposed wind speeds were considered. Cold-flow simulations yielded wind speed profiles that closely matched the experimental measurements. Next, fire simulations with only the surface fuel were conducted to verify the rate of spread while factors such as substrate properties and fuel moisture content were varied. Finally, simulations with both a surface fuel and a crown fuel were completed. Examination of specific surface fire characteristics (rate of spread, flame angle, etc.) and the corresponding experimental surface fire behavior provided a basis for comparison of the factors most responsible for transition from a surface fire to the raised fuel ignition. The rate of spread was determined by tracking the flame in the Smokeview animations using a tool developed for tracking an actual flame in a video. WFDS simulations produced results in both surface fire spread and raised fuel bed ignition which closely matched the trends reported in the laboratory experiments.

464 9:30 am
Opposed-Flow Flame Spread in a Narrow Channel Apparatus over Thin PMMA Sheets
Garrett Bornand, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

Flame spread tests have been conducted over Polymethylmethacrylate (PMMA) samples in San Diego State University’s Narrow Channel Apparatus (SDSU NCA). The Narrow Channel Apparatus (NCA) has the ability to suppress buoyant flow in horizontally spreading flames, and is currently being investigated as a possible replacement or complement to NASA’s current material flammability test standard for non-metallic solids, NASA-STD-(I)-6001B Test 1. The buoyant suppression achieved with a NCA allows for tests to be conducted in a simulated microgravity atmosphere—a characteristic that Test 1 lacks since flames present in Test 1 are buoyantly driven. The SDSU NCA allows for flame spread tests to be conducted with varying opposed flow oxidizer velocities, oxygen percent by volume, and total pressure.

Flame spread results from the SDSU NCA for thin cellulose fuels have previously been compared to results from tests in actual microgravity at various test conditions with the same sample materials and were found to be in good agreement. This article presents results from the SDSU NCA for PMMA at 1 atm
pressure, opposed oxidizer velocity ranging from 5 to 40 cm/s, oxygen concentration by volume at 21%, 30%, and 50%, and fuel thicknesses of 25 and 75 microns. These results are compared to results from actual microgravity test results for PMMA obtained at the 4.5s drop tower of MGLAB in Gifu, Japan, and the 5.2s drop tower at NASA’s Zero-Gravity Research Facility in Cleveland, OH. This comparison confirms that at 1 atm pressure, the SDSU NCA successfully simulates microgravity for not only thin cellulose fuels, but also for thin PMMA sheets as well. This concretes the argument that the SDSU NCA is a viable option to complement or replace NASA’s Test 1 for material flammability testing. Tests with thick fuels will be conducted in the future to further characterize the SDSU NCA.

465  9:45 am

Quantifying the Santa Ana Winds in Rancho Bernardo for the Validation of Wildland Urban-Interface Fire Dynamics Simulator

Chad Espina, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

A computer code, Wildland Urban-Interface Fire Dynamics Simulator (WFDS), is currently being developed by the National Institute of Standards and Technology (NIST). WFDS has the ability of simulating wildfires with prescribed conditions such land topography and wind conditions. Once computer simulations match field data, WFDS will have the capability of predicting wildfire behavior. In this initial stage of the project, support for the development of the computer code focuses on the validation of the wind flow simulation on complex terrain including trees and houses. The validation of the wind flow requires field data. Wind monitoring instruments, a system of wind vane and anemometer, are currently set up in Rancho Bernardo. These instruments will gather the wind data needed to validate WFDS simulations. Locations of the instruments are based on the path of the 2007 wildfire influenced by the Santa Ana Winds. Another wind data gathering device that will be used is a Sonic Detecting and Ranging unit (SoDAR). A SoDAR unit gathers wind speed and direction from sound waves, initially emitted by the SoDAR, that are reflected from the air flow above the SoDAR. Accuracy of the data gathered by the SoDAR is validated by a meteorological tower operated by the National Oceanic and Atmospheric Administration (NOAA) located in northern California. There are two other SoDARs stationed in Texas and are being used in comparing wind data gathered by an Unmanned Aerial Vehicle (UAV). A Wind Dart, an independent wind-measuring instrument that is attached to a UAV, is also being tested. A Matlab code has been developed to graphically represent wind data gathered by the anemometers and wind vanes in Rancho Bernardo. The code can graph user-specified time intervals and can compare data from different sites.

466  10:00 am

Measurement of Carbon Dioxide Field and Temperature Field in a Steady State Flame

Wynn Tran, Mechanical Engineering (M)
Subrata Bhattacharjee, Mechanical Engineering

Fire research has been an ongoing interest for decades. The purpose of this investigation is that the more we know about flame the better we can utilize it and practice fire safety. While there has been a lot of research in the academia world, one the primary focus has always been on flame spread rate. There is however still lacking information on the flame structure and species field. To fully understand the mechanism of flame propagation and fire safety we need to investigate the flame structure. At the SDSU Computational Thermodynamics Laboratory an apparatus known as the Flame Stabilizer is built to study the structure of a small scale downward spreading flame. The flame field and species field investigated are from GE Whatman™ Grade 1 filter paper. To keep the flame stationary for measurements, the flame is tracked with a thermocouple in a linear actuator system and the motion is controlled by a PID algorithm under NI LabVIEW. The flame field is measured in temperature with K-type thermocouples. The species field is measured in CO₂ with a non-dispersive infrared radiation (NDIR) sensor. A 2-D grid system is implemented in the x-axis and y-axis directions as a mapping field to the structure of the flame field. Temperature and CO₂ sensors are placed in this grid system for measurements. The motion of the grid system is controlled by motors in the x-axis and y-axis directions under MATLAB. The results are then compared to a computational model to validate the findings.

467  10:15 am

Characterizing chaparral biomass accumulation using a time series of satellite imagery

Kellie Uyeda, Geography (D)
Doug Stow, Geography

Chaparral recovery following a wildfire has been well studied for small areas during the first few post-fire years, but studying long-term recovery over large areas is typically more difficult. Satellite imagery offers an opportunity to study chaparral growth dynamics at regional scales, including the regrowth of chaparral following fire, current biomass levels, and the response of chaparral to varying annual precipitation. I generated a time series of Moderate Resolution Imaging Spectroradiometer (MODIS) imagery from 2000–2012 to examine regional chaparral growth dynamics for a chronosequence of chaparral ranging from 5–90 years since the last burn. Using TIMESAT software, I produced a time series of normalized difference vegetation index (NDVI) data for each area of interest, as well as metrics of growth for each growing season. Preliminary results indicate that older stands add less new growth in each growing season, but maintain higher overall vegetation levels compared to younger stands of chaparral.
Impacts of an invasive mussel on sea floor biogeochemistry and community composition in a Southern California estuary

Jennifer Schefski, Biology (U)
Kevin Hovel, Biology

In coastal ecosystems, filter-feeding bivalves (e.g., mussels, clams, and oysters) often have strong ecological impacts by changing benthic biogeochemistry. The invasive Asian mussel *Musculista senhousia* has been introduced to several California estuaries, where it has shown the potential to cause major biogeochemical and ecological changes. At high densities, *M. senhousia* dramatically alters benthic structure, sediment conditions, and fluxes of nitrogen and sulfur. Habitat modification by *M. senhousia* changes native communities of marine flowering plants, bivalves, and other infauna. However, natural abundances of this invader vary dramatically over space (e.g., along estuarine gradients) and time (e.g., intra- and interannual population oscillations), making generalizations about potential impacts difficult. With this variability in mind, we investigated the effects of *M. senhousia* density on benthic biogeochemistry and community composition in Mission Bay, San Diego, CA. We manipulated the density of mussels (0, 250, 500, 1000, 2000, 4000, and 8,000 individuals m\(^{-2}\)) in an intertidal field experiment. After 11 weeks, we sampled (interstitial) porewaters, sediments, mussels, and benthic macroalgae, and macrofauna (>1000 μm). We quantified sediment silt content and organic matter, porewater oxidation-reduction potential, and porewater concentrations of ammonium and dissolved sulfides. Mussel biomass was positively correlated with the proportion of fine sediment and organic matter (R\(^2\) = 32.5% and 49.9%). Increasing mussel density reduced the variability of all porewater parameters, but had no effect on mean values. Increasing mussel biomass was matched by a linear increase in macroalgal biomass (mainly *Ulva* spp.), which was probably caused by holdfasts attaching to mussel shells and/or mussel nitrogen waste stimulating algal growth. Results for changes to the benthic macrofaunal community are forthcoming, but preliminary findings suggest that *M. senhousia* does not have major impacts on benthic biogeochemistry and macroalgae until a density of approximately 2000 individuals m\(^{-2}\) is reached.

Thermal and nutrient dynamics in a chronically eutrophied drinking water reservoir

Raymond Lee, Geography (M)
Trent Biggs, Geography

Water quality in San Diego drinking water reservoirs is compromised by seasonal algal production, which may lead to significant economic costs for cities that draw water from them. This study examines thermal, oxygen and nutrient dynamics in four drinking water reservoirs—Hodges, Barrett, Sutherland and Morena—in a semi-arid region to elucidate the processes leading to exceptionally severe anoxia observed at one of the sites (Lake Hodges). Hodges is the primary focus, as algal blooms are reportedly worse there, and the other sites control for variables, such as water source (imported water from Colorado River and Sacramento River vs. local runoff) and land use in the respective watersheds (presence of agricultural activity and urban development-impervious surface). Data suggest that in Hodges, autochthonous phosphorus is a significant source of nutrient loading. Also, lake water volume is a significant control on the length and strength of summer stratification and extent of anoxia.
Physiological effects of climate change on the giant kelp, Macrocystis pyrifera
Matthew Brown, Ecology (M)
Matthew Edwards, Biology

Anthropogenic climate change is a major threat to global biodiversity and ecosystem health. In the last century, average global atmospheric temperatures have risen roughly 1°C, with sea surface temperatures rising concurrently. This rise has been attributed to increases in global atmospheric CO₂, the majority of which is driven by human activities. In addition to changing the world’s temperature, CO₂ emissions are altering the carbon chemistry of the ocean. Carbon in water exists in the form of diffuse CO₂, bicarbonate and carbonate. As CO₂ is added to the oceans it shifts the distribution of carbon, resulting in larger amounts of diffuse CO₂, a sharp decrease in carbonate and an increase in acidity. All of these factors have the potential to drastically affect the health and stability of coastal ecosystems. While many studies have examined the effects of climate change on marine algae, much of the focus has been on phytoplankton and coraline macroalgae, and we know comparatively little of how climate change will affect non-calcifying species. For this study we chose the giant kelp Macrocystis pyrifera. Macrocystis is the primary canopy-forming kelp along the southern coast of California, providing habitat for numerous species, some of which are associated only with kelp forests. We cultured apical tips of Macrocystis for one month in laboratory mesocosms under four conditions; ambient (12°C and 500ppm), elevated temperature (15°C and 500ppm), elevated CO₂ (12°C and 1500ppm), and elevated temperature and CO₂ (15°C and 1500ppm). Growth rates were measured weekly, while photosynthesis and chemical composition was measured at the end of the experiment. Kelps cultured under elevated temperature showed significant reductions in growth and photosynthesis, while elevated CO₂ had no significant effect on these parameters. Interestingly, kelps cultured under both factors together showed greatly increased rates of photosynthesis and growth. These results suggest that Macrocystis may benefit physiologically from climate change, and that studies which only examine one aspect of climate change may present an inaccurate and incomplete picture.

Integrating Pattern with Process: Great Pacific Fracture Zones Correspond With Tectonically Homologous Biogeographic Boundaries in Western North America
Andrew Gottscho, Evolutionary Biology (D)
Tod Reeder, Biology

The western margin of North America is a dynamic, geologically complex region that has puzzled and intrigued historical biogeographers for over a century. The discovery of an active plate boundary along the west coast (the San Andreas Fault and Sea of Cortez) and the advent of plate tectonics theory revolutionized our understanding of the historical biogeography of this unique region, but there are still many unanswered questions and longstanding controversies remaining to be solved. Here, I present a broad, interdisciplinary literature review in an attempt to synthesize a new tectonic framework for biogeographic and phylogeographic studies along the west coast of North America, and I extend the evolutionary concept of homology to plate tectonics and biogeographic boundaries. The biogeography of a wide variety of marine and terrestrial animals ranging between northern California and southern Mexico will be reviewed, including the North Coast Divide/Cape Mendocino, Transverse Ranges/Point Conception, Vizcaino Desert/Punta Eugenia, and the Sierra Transvolcanica/Cabo Corrientes. I will argue that all of these biogeographic boundaries originated via the same mechanism (subduction of transform faults in the East Pacific Rise), and thus are homologous in a tectonic sense.

Oral Presentation: Identity: Resistance, Bias, Stereotyping, and Change
Saturday, March 9, 2013, 9:00 am
Location: Love Library 261

The Cult of Rooster
Jessica Rowe, English (U)
Darlene Emily Hicks, English and Comparative Literature

I will be writing a book of fiction emphasizing Baruch Spinoza’s definitions of emotion, and affect as conceptualized by Gilles Deleuze. Content will reflect the complex system of the brain; specifically studies showing how organic substances rewire the brain. However, the narrative will rely heavily on social issues, science fiction, and fantasy as this is a creative project. The narrative will also be chronotopic, in that it reflects Bakhtin’s emphasis on a character’s movement as temporal and spatial. The entire book will involve one character traveling two city blocks. However, the main character’s travel is not constricted due to lack of space. The character will experience life through altered states of mind, bringing attention to the complexity of the brain in relation to substance abuse and PTSD. Throughout the book, Spinoza’s work will emphasize the origins of the stereotype, and the benefits of increasing affect according to Deleuze. Complexity theory will be the major theme, though. All of this will be done in a way that is inclusive of any audience, regardless of age or level of education. Also pertinent to
complexity theory are the song lyrics included before the introduction. The content of said lyrics has a definite connection to complexity theory. There will be two covers completed by two different artist/musicians, emphasizing Spinoza's concept of the signifier and the signified. Artists, musicians, and writers will demonstrate the benefit of Deleuze's affect as demonstrated by the finished product. There will be two paperbacks (first and second printing) with ISBN's that either a scholar, or a young adult will find interesting.

474  9:15 am

**Satire and the Carnivalesque in Flann O'Brien's The Third Policeman**

Alma Castro, English (U)
Jeanette Shumaker, English

Many authors have had to express themselves in ways so that their messages can evade censorship and such is the author of *The Third Policeman* (1967).

Flann O’Brien was born into a family of devoted Irish nationalists, where English was not spoken. He wrote many books and was also the writer for twenty-six years for a newspaper column in which he satirized Irish culture and politics. He had many problems with his boldness of expression in his column and it was because of this constant censorship that Flann O’Brien wrote cryptically.

O’Brien’s uncanny carnivalesque description of Hell in *The Third Policeman* is an extremely comical representation of religious, philosophical and political ideology in Ireland. Bakhtin’s theory of the carnivalesque runs rampant throughout O’Brien’s novel. The reader can certainly agree that nothing better describes the main characters’ unlikely and bizarre adventures in Hell. The comically obese Sergeant Pluck, the extraordinary vision of MacCruiskeen, the telescopic eyes of Mathers and Martin Finnucane, and the fantastical lift to eternity can be described as carnivalesque. The nameless protagonist is the representative for the many mistreated and misrepresented Irish citizens from the days of English Colonialization. O’Brien also utilizes a backwards, rural, and seemingly uneducated style of dialogue which is the basis for humor, and ironically, also O’Brien’s way to express his nationalism. He is seeking to represent the Irish during their struggle to preserve their Gaelic language and to resist the tyranny of the Catholic Church.

The Policemen in the novel scare the protagonist into believing that molecules from bicycles can somehow attach themselves to humans and vice versa and as a result they will begin to act as the object they came in constant contact with and thus adapt its personality. A better understanding of Sergeant Pluck’s theory is that the molecular exchange in *The Third Policeman* alludes to the exploitation of English colonialism in Ireland. O’Brien uses the satirical and the carnivalesque to criticize the illogicality of colonialism.

475  9:30 am

**Marriage’s Institutional Gender Bias and The Same-Sex Marriage Debate**

Joshua Stutz, Philosophy (U)
Steven Barbone, Philosophy

Marriage equality is a contemporary issue about which there is no clear consensus. Reforming the institution of marriage to include same-sex couples is a fiercely debated issue in American politics. The proponents of both inclusion and exclusion have divergent ethical paradigms, inhibiting a constructive dialog. The goal of my project is to formulate an argument that supports inclusion without appealing to contested assumptions (e.g., sexuality is innate, the government should promote morality, individuals have a right to marry, etc.). Analyzing various philosophic, political, and popular arguments for and against ratifying allowed me to identify both contested assumptions and major objection to same-sex marriage. Supplanting this rhetorical survey, I examined the history, practice, and legal significance of marriage. Approaching the issue from the angle of gender bias defuses common objections without appealing to any contested assumptions. In addition to having numerous rhetorical benefits, couching a normative argument for inclusion in gender bias changes the linguistic scheme of the debate. Instead of promoting gay marriage, my position opposes marriage with a gender bias. Since any unmarried adult’s set of suitable partners is restrained by his/her gender, the institution of marriage has a gender bias. If we agree that gender should not limit a person’s choices and/or opportunities, then we should reform marriage’s gender bias. If marriages gender bias is reformed, then the inclusion of same-sex couple would be a primary effect. Strengthening the position of inclusion, this novel approach to marriage equality avoids contested assumption, shifts the burden of proof, and circumnavigates common objections.

476  9:45 am

**Male Homosexuality in Late Imperial China: Masculinity, Femininity, and Gender Repair**

Jonathan Eng, History (M)
Kathryn Edgerton-Tarpley, History

Was homosexuality prevalent in China during the late imperial period? By focusing on and analyzing homosexual relationships, specifically between upper-class men and young boys, I hope to discover how masculinity was defined in the Ming and Qing periods as well as how traditional Confucian values were affected. The methodology used are the erotic novels from the Ming and Qing periods as well as the legislation passed by the Qing government in order to curb homosexuality as a way to stop the degradation of traditional Confucian values. Ultimately, I conclude that homosexuality was prevalent and fairly accepted in the Ming dynasty because the upper-class
men who comprised the literati class had so much free time that they were able to let their intellect and creativity roam free and pursue these relationships which they subsequently documented. Once the Manchus came to rule and the Ming dynasty ended, sweeping conservative reforms paved the road towards derailing homosexual relationships. The Manchus were very well-versed in Chinese culture saw that these homosexual relationships were dangerous to the family and prevented males from fulfilling their filial duties. “Dangerous males” came to define those who initiated homosexual relationships and the Qing government, with pressure from Western scrutiny as well as an internal rededication towards the Confucian classics, sought to punish them as part of the reforms and legislation. Despite the initial efforts to curb homosexual relationships, the Qing ultimately failed as later rulers engaged in homosexual relationships themselves and reverted China to the level of toleration on the issue of homosexuality that the Ming period literati freely enjoyed.

477 10:00 am

Intersections of Identity through the Linguistic Performance of an Openly Gay Christian Minister
Amanda Meza, Linguistics (M)
Douglas Bigham, Linguistics and Asian/Middle Eastern Languages

This case study examines an openly gay Christian minister and his language usage in a series of recorded sermons addressing the topic of sexuality. After this speaker publicly came out to his congregation as a gay man, these sermons were delivered in order to address the impact of this event on the church body. As part of a collection of publicly accessible audio files, these sermons were also made available to a larger online audience. This investigation of the transcribed texts explores how these sermons functioned to publicly incorporate a growing number of gay and lesbian church members into a congregation which had not been previously affirming of openly homosexual church members. Focusing on how this speaker frames these sermons for gay and heterosexual audiences through specific discursive practices, this work describes how language can be used to negotiate and reconcile seemingly disparate communities. Further, this work identifies how this pastor employed linguistic tools to integrate the gay and heterosexual members in this church as one community and yet still address them as distinct audiences. The study of these sermons provides unique insight into how religious movements can use language to construct discourses of reconciliation and progress, particularly through employing linguistically embodied ideologies in order to embrace sexual minorities. As a member and leader of a religious body and an openly gay man, this minister offers a unique perspective on the intersection of evangelical Christianity and the LGBT community through the active construction of a church identity that is distinctively gay and Christian.

Session E-7
Oral Presentation:
Graduate Research in Cell Biology
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 76

478 9:00 am

The Role of Placental Extracellular Matrix in Trophoblast Differentiation
Trishana Smith, Biology (U)
Mana Parast, UCSD Pathology

Does placental extracellular matrix (ecm) have “memory” to signal the process of what cells should become, such as directing trophoblast lineage specification or maintaining the cytotrophoblast state, in vitro? Extracellular matrix is the biological scaffold that is known to support cells structurally while providing unknown factors to assist in cellular function. When culturing trophoblasts on a placental ECM-coated well, a novel alternative to Geltrex or plastic, it will be determined if placental ECM creates a better environment for trophoblast differentiation. So far, it has been discovered that undifferentiated human embryonic stem cells will not adhere to third-trimester placental ECM, and thus trophoblast lineage specification cannot be addressed until the testing of first- and second-trimester ECM. When human embryonic stem cells were differentiated into cytotrophoblasts and placed on various concentrations of third-trimester placental ECM, they not only adhered, but their secretion of hCG, a hormone known to be secreted by syncytiotrophoblasts (derived from cytotrophoblasts that have differentiated), was ECM-concentration dependent with 1mg/ml of ECM producing results closest to Geltrex. This leads to the current hypothesis that placental ECM is altering trophoblast differentiation. After plating isolated third-trimester primary cytotrophoblasts on third-trimester ECM, it was concluded that placental ECM appears to have a profound impact on trophoblast differentiation. While the amount of cell fusion on the ECM and mRNA expression of CSH-1, p63, CGB, and CGA, indicated a decrease in trophoblast differentiation, surprisingly, the placental ECM seems to also drastically increase the amount of hCGB secretion. Thus, with hCGB secretion being the definition of a syncytiotrophoblast, it can be assumed the placental ECM functionally increases trophoblast cell differentiation.
479  9:15 am

Biomedical Image Analysis with CUDA based concurrent computations of cardiomycyte contractility

Hung Nguyen, Computational Science (M)
Paul Paolini, Biology

A definite trend in assessment of cardiac cell contractility and other properties associated with contraction (gene expression levels, calcium transients, etc.) has shown that muscle researchers are moving toward fully digital data processing versus conventional biological methods for analysis. Though the literature tells us there are existing digital methods, often these methods are inefficient and require significant processing time and human user interaction in order to sort the data. Such methods are highly sensitive to various sources of noise in the signals. In this project, we introduce various novel approaches to image analysis of cardiomycyte contractility with the assistance of CUDA-based computations that augments previous work done by David Torres Barba. In addition, we introduce a novel approach to quantification of protein in cells as measured by western blot. We will describe various image processing functions which we have implemented into software that simplifies and expedites the processing of digital media by the user. Automated methods to select regions of interest replace slower user-dependent procedures. Faster CUDA-based algorithms take advantage of NVIDIA's GPU processors, calculate and analyze continuous data in parallel rather than sequentially. A series of tests performed on real data sets show dramatically decreased runtime, improved accuracy, and increased productivity compared to previous works. With the development of this software, we expect to significantly reduce the time required by investigators to analyze increased numbers of data sets with improved accuracy.

480  9:30 am

Hypervariable Immunoglobulin-like Domains: An Edge for Bacteriophage Adaptation to Their Host

Lauren Paul, Microbiology (M)
Forest Rohwer, Biology

Bacteriophage (phage), are the most diverse and abundant biological entities on the planet. Phage drive microbial diversity and regulate bacterial communities in both environmental reservoirs and the human microbiome. The immunoglobulin-like (Ig-like) domain is one of the most integral protein folds found in nature, and is commonly present on the surface of phage capsids. Previous research established that enrichment of phage in the mucosal surfaces of organisms ranging from cnidarians to humans functionally protects underlying epithelia from bacterial pathology. This protection was the result of specific interactions between the Ig-like domains located on the phage capsid and glycan residues of the mucosa. We hypothesize that mutations in hypervariable phage capsid proteins, such as the Ig-like domains, result in an enhanced T4 phage adherence to environmental interfaces. Here, we experimentally validate the adaptation of phage Ig-like domains to mucosal surfaces through positive selection pressure. Naïve T4 phage were separately applied to three diverse mucosal surfaces: coral, hydra and lung epithelial cells. Mucus-adherent phage were propagated with the Escherichia coli bacterial host, and reapplied to the same mucosa six times to select for phage with increased mucus adherence. The resulting ‘evolved’ T4 phage showed increased mucus-adherence when compared to that of a naïve T4 phage. The T4 phage genomes were sequenced and functionally profiled for glycan binding, to elucidate if changes in Ig-like domains were responsible for the increased adherence of phage to mucus. Based on the plasticity of Ig-folds and the ubiquity of phage in nature, we further explored alternative biological surfaces that may accumulate phage. We observed the same pattern of phage enrichment to plant surfaces, which produce a high-molecular weight polysaccharide, compared to the adjacent aqueous environment. Due to the interaction between phage Ig-like domains and glycan residues, we propose the Bacteriophage Adherence to “X” (BAX) model. Here, phage may accumulate to any glycan-coated, host-environmental interface (e.g. plants, insects) through adaptable Ig-like domains. The BAX model will have broad applicability across disciplines, including microbial ecology, immunological studies, and emerging infectious diseases as it likely acts on all higher organisms.

481  9:45 am

Sustained Reduction in Neurogenesis Following the Establishment of Persistent Coxsackievirus Infection in the Host

David Vinh-Phuc Nguyen, CMB (M)
Ralph Feuer, Biology

Group B coxsackieviruses are pathogenic viruses known to cause acute and chronic inflammatory diseases of the brain, heart, and pancreas in humans. Central nervous system (CNS) infections that are left untreated may contribute to long-term sequelae such as neurological diseases. The molecular mechanisms determining the tropism of coxsackieviruses and their ability to persist in the host CNS remain unclear. Previous data in our laboratory have suggested neural progenitor and stem cells (NPSCs) are primary targets for coxsackievirus B3 (CVB3) infection. We wished to investigate the effects of a persistent infection upon neural stem cell function in the adult host. Three-day-old C57BL/6 pups were mock-infected, or alternatively, infected with a sublethal dose of a recombinant CVB3 expressing the enhanced green fluorescence protein (eGFP-CVB3). After 90 days post-infection (PI) NPSCs were isolated and analyzed for alterations in their ability to differentiate into neurons, astrocytes,
Role of mitophagy in statin-mediated myopathy

Mridula Ramesh, Biology (M)
Roberta Gottlieb, Biology

Statins are widely used drugs to reduce circulating cholesterol levels in combating cardiovascular diseases. They inhibit HMG-CoA reductase, which is the rate limiting enzyme in the cholesterol biosynthetic pathway. Although they have been shown to have exceptional benefits for the heart, they are known to cause harmful side effects in skeletal muscles—skeletal muscle myopathy. Statin-mediated upregulation of autophagy and promotion of mitophagy has been shown to be cardioprotective. Autophagy is the mechanism where the cells degrade unwanted or non-functioning cellular components, such as large protein aggregates and damaged organelles through the lysosomal machinery. Though the mechanism of cardioprotection by statins is largely understood, the reason for their deleterious effects on skeletal muscles is not fully understood.

To investigate statin-induced skeletal muscle myopathy we utilized C2C12 myoblasts. C2C12 cells were differentiated for 6 days into myotubes and were then treated with 2μM simvastatin for 24h to observe their effects. Statins were shown to up regulate autophagy in the cells, which was verified by the attenuation of the Akt/mTOR/ULK1 pathway and an increase in levels of the autophagic marker LC3-II by western blot analysis. Surprisingly, statins diminished mitochondrial mass as indicated by decreased levels of Tom-70 and Cox4. Blocking autophagic flux with bafilomycin revealed an increase in the levels of p62/SQSTM1 in the mitochondrial fraction suggesting increased mitophagy. This was supported by the prevention of Tom70 and Cox4 loss.

Many patients who are on a daily dose of statins complain about muscle fatigue or pain. Studies indicate that statins, by diminishing mitochondrial respiration, brings about an energy crisis in skeletal muscles. How mitochondrial function becomes compromised is unclear. This leads us to hypothesize that statin-mediated skeletal muscle myopathy is initiated by extensive mitophagy. This study will examine the contribution of mitophagy in this process.
Leonard Knight only had intentions to remain in the Imperial Valley for a week but the week turned into twenty-five years. Motivated by spreading the message of God's love, Knight began his mission with a hot air balloon and ended up building a mountain. Since his first bag of cement touched the sandy earth in 1986, and his “splooch” technique began to coat the mountain in religious message and art, Knight never stopped building, painting, and believing in Salvation Mountain. Even after the mountain collapsed in 1989, he started over again, and then in 1994 when local politicians threatened to demolish his structure people rallied to save Knight's mountain. The threat to demolish Knight’s mission and message brought about the local and national support for Salvation Mountain, facilitating in the monuments preservation. This essay seeks to explain the historical origins of Leonard Knight and his devotional structure that is Salvation Mountain. Further providing a detailed background into how the monument faced destruction as an environmental hazard due to the artist use of massive amounts of paint, but gained national media attention through the grassroots efforts of local Imperial Valley residents thus allowing it to become a protected and recognized piece of folk art. And conclude with the current state and future of the mountain and its creator.

The Riparian Vegetation of San Diego's Mission Valley
Aaron Wade, Geography (M)
Arielle Levine, Geography

Mission Valley is part of the San Diego River floodplain and got its name from the religious and military outposts that were built there in late 1700’s by Spanish Catholics. From this time well into the 1960’s the main human activities in the valley were agriculture and mining. Only until the last half of the last century did it become a major commercial, residential, and recreational area. These activities have displaced almost all of the original riparian vegetation that grew across the valley floor. Before this happened there were three general areas of succession: a channel area with sand and sedges, a willow zone, and riparian woodland. This presentation intends to show exactly what has changed, as well as explore the possible future development of the area. Lastly I will argue whether or not it is possible to bring back Southern California’s riparian vegetation into this heavily impacted urban zone.
487  9:45 am
City in Motion: Growth and Development in Mission Bay and Mission Valley
Matthew Vasilakis, History (M)
Sarah Elkind, History
In mid-20th century, San Diego, California was in a frantic effort to secure its regional economy. San Diego was in motion, moving towards new goals and expanding rapidly to reach them. Urban development in the city was dictated by this need for economic grounding, and city leaders and citizens alike compromised and conceded local control to powerful interests in order to obtain it. This was the scenario that played out in Mission Bay and Mission Valley (San Diego’s historic floodplain) where the transformation of these landscapes was heavily influenced by economic fears and special interests. In order to prove this thesis, a variety of primary sources from the San Diego State University archive and secondary sources written on San Diego history have been gathered. A compilation of government documents, period articles, newspaper commentaries, photographs, and maps provide insights into San Diego’s urban development in the mid-20th century. The history of urban development in Mission Bay and Mission Valley carries weight as San Diego grapples with future land-use decisions while simultaneously advancing its own economic interests into the 21st century.

489  9:15 am
Obsessive Compulsive: (Dis) Order
Alexandra Hopp, Art (M)
Sondra Sherman, Art, Design and Art History
The subject of my thesis work is Obsessive Compulsive Disorder, how it relates to myself, the culture at large, the history of the disorder, and especially its relationship to the identity and practices of the goldsmith.

The habits of Obsessive Compulsive Disorder and the practice of the goldsmith are strikingly similar: Both engage in repeated, ritualized activity ad infinitum, both are obsessed with notions of control and with minute details. The only difference is that the former is characterized as a disorder while the latter is seen as a certain temperament beneficial to the goldsmith.

My goal with this body of work is to physically manifest the symptoms of OCD and to make evident to the viewer what the hallmarks of OCD and the nature of goldsmithing are: obsessively detailed, repetitive activities on a minute scale. I intend to use the traditional jewelry forms and visual vocabulary of the goldsmith, i.e., traditional jewelry formats: stone settings, chain, findings, etc. but in such profusion that their original functions are lost and they just become an exercise in mania.

“KNOWING FULL WELL that generalizations are dangerous, I offer this one: All good artists are obsessive. They are obsessive about their materials, their subjects, their vision. Obsession provides the kind of focus that allows an artist to make an in-depth inquiry into a theme, and push it until the usual gives way and something new emerges.”
— from the statement of the gallery show Do Not Touch by curator Meg Schiffler

“In the requirement that the [OCD] behaviors produce “marked distress” in the person, how one arrives at distress is crucial. The same behaviors in different cultures might produce different results...If your behavior, say the meticulous lining up of objects, is seen as an oddity, you will be distressed that you do it. If it is seen as the useful quality of a master bricklayer, then you will not be distressed.”
— from Obsession, a History by Lennard J Davis
Unmasking the Narrative: Asian American Activism in Secret Identities: Asian American Superheroes Comics Anthology and Shattered: The Asian American Comics Anthology
Jonathan Valdez, Liberal Arts and Sciences (M)
William Nericcio, English
This paper examines activism from the Asian American community by focusing on comics in the Secret Identities: The Asian American Superheroes Anthology and Shattered: The Asian American Comics Anthology. This paper assumes a visual rhetoric and postcolonial perspective and examines how Asian American writers and artists challenge Orientalist stereotypes and discourse through the medium of comics by creating their own characters and narratives defying portrayal of Asian Americans in homogenized and limited representations. The first section of the paper defines how Orientalism plays a significant role in the semiotics of the Asian American image and discourse and also examines how the system of comics is utilized in dispelling Orientalist beliefs and provides a platform to challenge these stereotypes. The second section focuses on comics from each anthology and how these comics constitute activism by creating a visual and discursive Asian American narrative by comparing and contrasting how each anthology responds to a specific Orientalist stereotype. The paper argues that such images and discourse articulate Asian American activism coalescing itself in the editing and production of the anthologies and how both anthologies seek to dethrone longstanding Orientalist stereotypes that loom over the Asian American community.

Toying with Stereotypes: Designing Alternatives to Polarized Representations of Gender Roles in Toys
Courtney Harmon, Graphic Design (M)
Arzu Ozkal, Art, Design and Art History
How many boys grow up to be ninjas versus fathers? How many girls choose princess as a career path? Even in our modern society, the majority of children’s toys continue to offer boys toys that focus on acts of heroism and violence and girls toys that equate fun with beauty and wardrobe changes. These themes are based on outdated gender stereotypes and fail to reflect the expanding gender roles of modern society.
Nowhere do toy packages read, “for boys or girls only,” but children learn from very early ages which side of the store they are expected to shop from. Girls learn that pink colors, flower and heart graphics, and swirled or bubbly typefaces are made for them. Boys look for dark colors, sharp and steely graphics, and bold typefaces. I have studied the semiotics of children’s toy branding to better understand the visual cues that label a toy as being specifically intended for either gender. These visual cues extreme political turmoil stemming from the need for underground communication and the human compulsion to build a cohesive community. This paper further explores the use of tattoos as permanent codex to communicate community loyalty with permanently engraved tablets of organized laws among antisocial criminal networks. Laws inked onto the criminal’s body do not allow him or her to forget or escape their bond and blood to their underground network. The author explores the criminological need to have insight into the criminal tattoo culture and ability to deciphering tattoo markers among gangsters and criminally active actors but also questions what new gateways are being opened for racial profiling that has turned international boarders into prison walls.

The Art of Communication: Tattoos as a form of Communication in the Criminal Social Structure
Mahalia Crotz, MPA and CJ (M)
Paul Kaplan, Public Affairs
This article explores the secret loquacious world of criminal tattoo art as tools of communication among under world affiliates. Communication of gang related identifiers by means of skin art is explored through the juxtaposition of Russian Thieves in Law (Thieves in law) and the transnational Salvadorian street gang Mara Salvatruch (MS-13). The author argues that tattoos are used as a means to denote status, rank, skill set and inclination to recidivism. Because the self is the only personal identifier that can hardly be lost, though seldomly forcibly taken away, or stripped away as a means of discarding the individual of their cultural and personal identity. This paper develops the theory that gang structuralizing have historically developed out of rebellion from the dominant and politically suppressive central state. Following a new theoretical vein based on ecological behavioral theorists Georg Schimmel the ideology of politically disenfranchised groups have given inertia to powerfully organized criminal gangs during times of extreme political turmoil stemming from the need for underground communication and the human compulsion to build a cohesive community. This paper further explores the use of tattoos as permanent codex to communicate community loyalty with permanently engraved tablets of organized laws among antisocial criminal networks. Laws inked onto the criminal’s body do not allow him or her to forget or escape their bond and blood to their underground network. The author explores the criminological need to have insight into the criminal tattoo culture and ability to deciphering tattoo markers among gangsters and criminally active actors but also questions what new gateways are being opened for racial profiling that has turned international boarders into prison walls.

The Chile Film (La Sangre Rojo y Verde de Nuevo Mexico)
Kelly Urig, Television, Film and New Media Studies (M)
Greg Durbin, Television, Film and New Media Studies
Food is a critical element in any culture. In New Mexico’s vibrant culture, no food stands above the chili plant, which is revered for its unique taste and quality. For generations, the chili farmers of New Mexico have devoted and dedicated their lives to growing and developing the chili plant. This project and the film, The Chile Film, La Sangre Rojo y Verde de Nuevo Mexico (available on DVD in the Media Center of Love Library), explore the special appeal of chile, and how it has become an integral part of the culture of New Mexico. Using a participatory method of documentary filmmaking and New Mexico’s landscape as a backdrop, The Chile Film, La Sangre Rojo y Verde de Nuevo Mexico is an exploration of the heart of New Mexican culture and way of life.
aid in having the product reach the intended audience, but are also barriers keeping children from engaging with toys in the other half of the toy store.

“Toying with Stereotypes” is a graphic design project aimed at developing concept toys that provide underrepresented themes to either side of the toy store. The D-Force Squad (Domestic Force) line of concept toys asks boys to consider acts in the home as comparably heroic to fighting crime. The D-Force characters find adventure in father roles that support the working mothers. The Princess Moto line of carriage-like vehicles transforms the classic passive and princess into an active participant in her kingdom. She reclaims her autonomy by bravely driving her own carriages to dangerous destinations.

By branding the toys in the existing marketing aesthetic, my goal was to have the toy blend in visually while offering alternative play narratives that better represent modern gender roles. The D-Force characters were modeled after popular warrior toys and the princess’ vehicles look much like fairytale carriages, but each is designed to be played with in untraditional ways.

Session E-10
Oral Presentation:
Undergraduate Research in Molecular Biology
Saturday, March 9, 2013, 9:00 am
Location: Love Library 408

494 9:00 am
Metalloantibody LT1002 Uses Ca$^{2+}$ to Bridge Antigen
Aaron Ward, Biochemistry (U)
Tom Huxford, Chemistry and Biochemistry

The biologically-active lipid, Sphingosine-1-phosphate (S1P), is a signaling molecule present in cell membranes that promotes heart disease, angiogenesis, and tumor growth. LT1002 is a murine Immunoglobulin G (IgG) antibody that specifically binds and inhibits the effects S1P. In order to combat the maladies promoted by S1P, the complimentary determining region (CDR) of human IgG has been modified to match the CDR of LT1002. This modified IgG is known as LT1009 and is currently in phase II clinical trials. X-ray crystallography revealed that two Ca$^{2+}$ bridge LT1009 and its S1P antigen. This was the first direct structural evidence of metal ion bridging in an antibody: antigen complex. While the role of Ca$^{2+}$ in the complex is clear, it is unknown to what extent Ca$^{2+}$ binds in the absence of antigen and whether other biologically significant metals interact with the antibody. To this end, we have conducted quantitative analysis of the binding enthalpy, dissociation constant, and stoichiometry of LT1002 binding to biologically relevant, divalent cations. We compared the binding properties of LT1002 with other non-metal binding IgG.

Isothermal titration calorimetry (ITC) was performed to measure enthalpy, dissociation/association constants, and stoichiometry of metal binding. When 3 mM Ca$^{2+}$ was titrated into a 30 uM solution of LT1002, we observed endothermic binding of Ca$^{2+}$ to LT1002 with a $K_D$ = 77.5 uM and LT1002:Ca$^{2+}$ binding stoichiometry of 1:2. Ba$^{2+}$, another metal ion that was observed to bind free LT1002 in previous studies, showed no binding to LT1002 by ITC and Ca$^{2+}$ failed to bind to control murine IgG1. ITC data, in conjunction with the crystal structure of an antigen-free antibody: Ca$^{2+}$ complex, indicate that Ca$^{2+}$ specifically binds to the epitope region of LT1002. We suspect that LT1002 first selectively binds Ca$^{2+}$ through partial coordination before it utilizes the bound cations to direct affinity toward the phosphate group of S1P. Supported by NIH MBRS-IMSD Grant 5R25GM058906

495 9:15 am
Examining double-strand break repair in vivo
Daryl Howden, Biology (U)
Anca Segall, Biology

Homologous recombination is a universal biological mechanism that processes and repairs double strand breaks in DNA by using an intact sister chromatid to repair a broken chromatid. This repair process is an error-free mechanism of fixing DNA breaks induced by radiation, chemical mutagens, reactive metabolites of oxygen and nitrogen, and other harmful agents that cells are exposed to hundreds of thousands of times per day. In bacteria, the exonucleases RecJ and RecBCD initiate the homologous recombination pathway, preparing substrates for the strand exchange protein RecA. RecA generates essential 4-way intermediates that are, however, toxic if they are not removed by the RuvC protein and other proteins. While the exonucleases are essential for maintaining the integrity of DNA, they also paradoxically degrade DNA during initiation. Thus DNA repair and DNA degradation are alternate fates during the processing of ends in vivo. To investigate recombination mechanisms in cells, we developed a physical enzyme assay to examine and quantify the activities of nucleases that repair double strand breaks. We induced breaks by the controlled expression of the homing endonuclease I-Ceu I at seven highly specific recognition sequences in the E. coli MG1655 genome. E. coli strains constructed to lack the RecA, RecB, RecJ or RuvC enzymes were grown to exponential or stationary growth phase and the digested fragments were separated using pulse field gel electrophoresis. Using the location of the I-Ceu I induced breaks the predicted fragments were identified for each mutant.
The extent of digestion and DNA degradation was determined by fitting the observed distribution of fragment lengths to a linear combination of Gaussian basis vectors found using fminsearch in MATLAB. Our results showed that DNA processing occurs at much higher rates during exponential growth phase and that chromosomes in stationary phase are more susceptible to I-Ceu I digestion. Our results agree with previous data that RecBCD is the primary nuclease for processing double strand breaks. In addition, we found that DNA fragments at some locations in the genome are more susceptible to degradation than others. Our results also show that I-Ceu I and RNA polymerase compete for access to the ribosomal RNA operons in exponential phase, when these genes are highly transcribed. In summary, our assay is effective at investigating the integration of recombination-dependent repair with chromosome structure.

**496 9:30 am**

**Bacteriophage Adherence to Mucosal Surfaces: Protecting the Underlying Epithelium from Cell Death**

Rita Auro, Biology (U)
Forest Rohwer, Biology

Bacteriophage (phage) are viruses that infect and replicate within bacteria. They are among the most common and diverse entities in the environment. Phage and bacteria are also known to be associated with mucosal surfaces. Mucus is primarily composed of mucin glycoproteins, but also contains: peptides, DNA, and other cell debris, that constitute the protective mucosal surface for the organism. Our research details a mucin-dependent increase in phage abundance on all surfaces that produce and secrete mucus. From these findings, we propose the Bacteriophage Adherence to Mucus (BAM) model, in which phage bind to mucus and provide a specific non-host-derived layer of immunity on mucosal surfaces.

Using *Escherichia coli* (*E. coli*) bacterial host and its respective T4 phage, we preformed in *vitro* studies using tissue culture (TC) cells, both with and without surface mucus. Mucus producing A549 human lung epithelial cells were cultured, grown as monolayers and stimulated with phorbol myristate acetate (PMA) to induce mucus secretion. Further, an A549 shRNA mucus knockdown cell line (*MUC*<sup>−</sup>) was created to reduce mucus production in A549 cells. Both cell lines were exposed to *E. coli* (10<sup>7</sup> ml<sup>−1</sup>) overnight, either with or without 30 minute pre-treatment with T4 phage (10<sup>7</sup> ml<sup>−1</sup>). Subsequent cell death was quantified using a FACS Canto II flow cytometer.

Results show that pretreatment of mucus-producing TC cells with phage reduced A549 cell death from *E. coli* bacterial insult by 10-fold (n=12, ***P<0.0001). Conversely, phage pretreatment of non-mucus producing *MUC*<sup>−</sup> cells decreased associated TC cell death by only 2-fold. The presence of a mucus layer, in combination with phage pretreatment, resulted in a 3.6-fold increase in A549 cell survival (n=12, *P=0.0181). Results show significant phage protection of mucus producing A459 cells, and decreased protection for non-mucus producing cells when exposed to bacteria. Phage adherence to mucus reduced bacterial colonization of the mucosal surface and protected the underlying epithelium from cell death. The mucus layer likely provides the first antimicrobial defense for the underlying mucosal epithelium and significantly contributes to the innate immune system.

**497 9:45 am**

**Adaptation of a High Throughput Assay to Monitor Cellular Protease Processing of the Hepatitis C Proteome.**

Samantha Diaz, Biology (U)
Roland Wolkowicz, Biology

Hepatitis C (HCV) affects over 170 million people worldwide, with a high incidence of chronic infection leading to liver fibrosis and hepatocellular carcinoma. With no available vaccine, current treatment for chronic hepatitis includes nonspecific treatment with interferon and ribavirin and two new protease inhibitors. However, poor response to treatment along with cytotoxic side-effects and appearance of resistance requires innovative approaches for the development of novel drugs and targets to combat HCV infection.

Upon entry, the viral RNA is translated into a polyprotein that is embedded within the Endoplasmic Reticulum (ER). The polyprotein is post-translationally cleaved into mature proteins by both the viral protease and host peptidases. The cellular signal peptidase is responsible for processing many of the protein boundaries within the ER luminal compartment, which is necessary for normal viral protein function and the production of new infectious viral particles. As such, we hypothesize that the processing of the HCV proteome by signal peptidase and similar host proteases could become a novel target for drug development against HCV. Here, we propose a high-throughput cell-based assay to monitor processing of the HCV proteome within the ER lumen.

For that purpose, a previously developed assay monitoring the proteolytic processing of the Human Immunodeficiency Virus envelope protein within the ER/Golgi is to be adapted for HCV. The assay relies on a double-tagged scaffold that discriminates between cleaved and non-cleaved events based on the cell surface expression of one tag (HA), or two (FLAG and HA), respectively. FLAG expression on the cell-surface can thus be used as a biosensor for the activity of peptidase processing of the HCV proteome through flow cytometry. The high throughput nature of the assay can be further exploited for the screening of drugs against HCV processing which represents a novel attractive antiviral target, with huge impact for the fight against HCV.
Melkani and LSAMP grant support to Mastaneh Nikravesh].

Parkinson’s disease (PD) is a devastating progressive neurodegenerative disorder affecting about one percent of individuals over 50. In terms of pathophysiology, PD is associated with the loss of dopaminergic (DA) neurons in the substantia nigra and neuronal accumulation of intracellular protein aggregates (Lewy bodies). Several genes are known to be associated with sporadic and familial PD including PINK1. Loss of PINK1 in flies leads to DA neuron loss and mitochondrial defects in several tissues, which is reminiscent of the multiple system involvement in PD patients. These features make flies an excellent model system to study PD progression and to identify novel genetic interacting partners that can ameliorate PD pathology. In this study, we developed a fly model in which we silenced PINK1 specifically in the flight muscles using the Gal4-UAS expression system. This causes abnormal wing posture and aggregation of mitochondria due to the accumulation and fusion of dysfunctional mitochondria in the flight muscles that were visualized using mito-GFP reporter. Furthermore, we have screened for genes that can improve PINK1 induced mitochondrial phenotypes. Rescue of abnormal wing posture in PINK1 mutants is used as a primary readout to isolate the candidate genes. The secondary assay includes the dissection of flight muscles and analysis of mito-GFP and cell death markers. We have identified p97/VCP as one of the PINK1 genetic suppressors involved in autophagy and mitochondrial quality control. Mutations in VCP/p97 are associated with inclusion body myopathy in early-onset Paget disease and frontotemporal dementia (IBMPFD). IBMPFD is a progressive degenerative disorder associated with defects in muscles and neurons. VCP/p97 is involved in extraction of ubiquitinated proteins from ER and mitochondrial membranes and targets them for degradation. VCP/p97 has been shown to target mitofusin for proteosomal degradation, which is an important step in induction of mitophagy mediated by PINK1/Parkin. We will further characterize these candidates together with Parkin mutants in detail to understand the mechanisms regulating the removal of damaged mitochondria. We will extend these studies to DA neurons and investigate the role of these genes in mitochondrial transport and dynamics in neurons. This study, in part, was supported by a Parkinson’s grant from NIEHS to Prof. Rolf Bodmer, NIH R-21 grant Dr. Girish Melkani and LSAMP grant support to Mastaneh Nikravesh].
Session E-11

Oral Presentation:
Mathematical Modeling and Equations
Saturday, March 9, 2013, 9:00 am
Location: Library Addition 63

500 9:00 am
Perturbed System of Linear Differential Equations
Ismael Perez, Mathematics (U)
Peter Salamon, Department of Mathematics and Statistics

Perturbation methods have been traditionally used for finding approximate solutions to otherwise unsolvable physical problems. We perturbed a system of linear differential equations that describe the chemical kinetics of site-specific recombination by the bacteriophage lambda. This is a mechanism that viruses use to insert their genome into the genome of their Escherichia Coli host. We have yet to find stable identification of the rate constants when using the Nelder-Mead (Simplex) Algorithm to minimize the sum of square errors between the data and the model. This is due to the fact that one of the steps in the reaction relaxes on a faster time-scale than the time-scale of our observations and that these observations cannot measure the difference between reactant and product in this fast step. If this fast reaction is always truly in equilibrium, we cannot see the rate constants for this equilibration. In fact however, a weak signal from the fast reaction can be seen in the first few seconds. To focus in on this signal, we perturbed the linear system to obtain a better identification of the rate constants. Using the Hessian of the sum squared error as a function of the parameters shows this to be a good technique on synthetic data with and without noise added. The low precision possible for real data limits the use of this technique for the original experiments.

We have shown that perturbation theory can be used in a new context, perturbing linear systems for parameter identification. The technique indeed improves identification of parameter values, but is not good enough to overcome the lack of precision in experimental data from site-specific recombination. Research supported by the SDSU MARC Program NIH/NIGMS Grant #5T34GM008303-23 and by the NIH/NIGMS MBRS IMSD Program Grant #5R25GM058906-12.

501 9:15 am
A Method for Minimizing Computing Core Costs in Cloud Infrastructures that Host Location-Based Advertising Services
Vikram Ramanna, Computer Science (M)
Christopher Paolini, Computational Science Research Center

Cloud computing provides services to a large number of remote users with diverse requirements, an increasingly popular paradigm for accessing computing resources over the Internet. A popular cloud-service model is Infrastructure as a Service (IaaS), exemplified by Amazon’s Elastic Computing Cloud (EC2). In this model, users are given access to virtual machines on which they can install and run arbitrary applications, including relational database systems and geographic information systems (GIS). Location-based services (LBS) for offering targeted, real-time advertising is an emerging retail practice wherein a mobile user receives offers for goods and services through a smartphone application. These advertisements can be targeted to individual potential customers by correlating a smartphone user’s interests to goods and services being offered within close proximity of the user. In this work, we examine the problem of establishing a Service Level Agreement (SLA) to determine the appropriate number of microprocessor cores required to constrain the query response time for a targeted advertisement to reach a mobile customer, within approachable distance to a Point of Sale (POS). We assume the optimum number of cores required to maintain a SLA is one which minimizes microprocessor core expenses, charged by infrastructure providers, while maximizing application service provider revenues derived from POS transaction fees. This problem is challenging because changes in the number of microprocessor cores assigned to database resources can result in changes in the time taken to transmit, receive, and interpret a targeted advertisement sent to a potential customer in motion. We develop a methodology to establish an equilibrium state between the utility gained from POS transaction revenues and costs incurred from purchasing microprocessor cores from infrastructure providers. We present different approaches based on an exponential, linear, and Huff method to model customer purchase decisions. From these models, the marginal cost and marginal revenue is calculated to determine the optimal number of microprocessor cores to purchase and assign to database resources.
Session F-1

Oral Presentation:
Undergraduate Research in Neuroscience
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 2203

502 9:30 am

Stability and Performance Analysis of the Castillo-Grone Mimetic Operators in Conjunction with RK3 Time Discretization in Solving Advective Equations

Mohammad Abouali, Computational Science (D)
Jose Castillo, Computational Science Research Center

The performance of the second- and fourth-order accurate Castillo–Grone Mimetic (CGM) gradient and divergence operator for solving advection equations, in conjunction with the RK3 time discretization scheme, is investigated. In addition, the effect of different interpolation schemes on the CGM operator’s stability is also studied numerically. It has been shown that, in all cases, the CGM operators were stable for Courant numbers higher than 1, and in some cases, up to a Courant number of 1.8. Furthermore, in the case of the fourth-order accurate CGM divergence operator and linear interpolation, the amplification factor is calculated analytically using the Von Neumann stability analysis method, and the accuracy and stability of the combined CGM and RK3 scheme is also discussed.

503 10:45 am

Impact of methodological variables on local functional connectivity measures in autism spectrum disorders (ASD)

Jose Maximo, Psychology (U)
Ralph-Axel Müller, Psychology

Functional connectivity MRI (fcMRI) studies have predominantly focused on temporal BOLD signal correlations between distal brain regions, thus much more is known about long than local functional connectivity. The only two ASD studies that have looked at local connectivity used the regional homogeneity (ReHo) approach, which uses Kendall’s coefficient of concordance (KCC) to compute the time series correlations between a given voxel and its nearest neighbors. Findings from these two studies were inconsistent, possibly due to methodological differences. The purpose of this study was to assess local connectivity using ReHo during resting state by manipulating cluster size and compare the results to an alternative local connectivity approach from graph theory.

Participants were 43 (21 TD, 22 ASD) whose pre-processing fMRI data consisted of motion and field map correction, alignment to high-resolution anatomicals, and standardization to the MNI template. Low-pass filtering (.008 < f < .08 Hz) was applied to isolate spontaneous low-frequency BOLD signal fluctuations. ReHo was computed using a cluster size of 6, 18 and 26 voxels respectively and spatial smoothing was applied (FWHM: 4mm). Group differences were assessed in separate two-sample t-tests for each cluster size. Local functional connectivity was also examined using the measure of local degrees from graph theory, defined for each voxel as the number of connected (r > .25) neighboring voxels within a < 14mm radius to the reference voxel.

ReHo results across all cluster sizes showed underconnectivity in ASD in right middle and superior frontal gyri, and left inferior frontal gyrus, whereas overconnectivity was found in left cuneus and uncus, right inferior temporal gyrus and bilateral cerebellar regions. Graph theory local density results showed underconnectivity in ASD in the medial portion of the superior frontal gyrus with overconnectivity in temporo-occipital regions.

We observed local overconnectivity in posterior regions accompanied by local underconnectivity in anterior regions in the ASD group. This pattern of findings was consistent across ReHo analyses using different cluster sizes. ReHo results were also overall consistent with graph theory local density findings.

Given that one previous ReHo study also used similar methods, differences in findings suggest that local connectivity analyses may be highly sensitive to small methodological differences.

504 11:00 am

Hemispheric asymmetry of white matter microstructure in autism spectrum disorder

Jeffrey Treiber, Psychology (U)
Ralph-Axel Müller, Psychology

Anatomical and functional asymmetries in typically developing (TD) individuals have been shown to correlate with executive control and language processing (Fornito, 2004; Szaflarski, Holland, Schmithorst, & Byars, 2006; Yin et al., 2011). For example, decreased brain asymmetry is associated with decreased language function in areas such as the uncinate fasciculus (Hugdahl & Westerhausen, 2010). ASD is a neurodevelopmental disorder characterized by impaired cognitive, sociocommunicative, and sensorimotor abilities. Previous studies have found atypical hemispheric asymmetries in various functional and anatomical networks in ASD (Cardinale, Shih, Fishman, Ford, & Müller, in press; Lange, DuBray, & Lee, 2010; Lo et al., 2011). Aberrant asymmetries have been shown to correlate with diagnostic and neuropsychological measures and their investigation could provide a better understanding of the neurological bases of autism. Previous studies have found white matter abnormalities within numerous tracts in children and adolescents with autism spectrum disorder. We used tract-based spatial statistics (TBSS) to examine the asymmetry of neuroanatomical connections of 26 children with ASD and 22...
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2013

The human brain is abundant in metals, which are essential for healthy cognitive function. Changes to the levels of metals may result in neurological conditions as seen in various disruptions to the central nervous system. In this project, Synchrotron x-ray fluorescence (SXRF) imaging was used to examine the metal concentration of postmortem and surgically resected brain tissue.

The postmortem tissue was donated by individuals with Williams Syndrome (WS) and the resected tissue samples were obtained from individuals undergoing surgical resections to control pharmacoresistant epilepsy. SXRF imaging was conducted at the Stanford Synchrotron Radiation Lightsource. The technique has previously been used to study other human brain conditions including Parkinson's and Alzheimer disease. This is the first study to examine WS and resected epilepsy tissue. We have previously shown that SXRF is a sufficiently sensitive technique to distinguish concentrations and co-localization of metals in brain structures. However, the method is still under development and additional studies are necessary to further validate its usage as a quantitative method that can be applied to a larger spectrum of brain conditions and tissue preparations. To this end, we analyzed the concentration and distribution of metals in tissue samples over multiple trials to test whether the detection of metal levels is altered as a result of repeated exposure to the high energy x-rays used in the technique. We hypothesized that there will be no significant difference between the concentration of metals during trial runs when examined over a short period of time.

Qualitative review of brain scans showed no marked differences and the quantification of endogenous metals using standards calibration is under investigation. The additional validation of this technique will enable us to better describe potential differences in metal concentrations in brain structures (e.g., frontal lobe, amygdala, hippocampus) associated with Williams Syndrome and epilepsy. The results could aid in identifying novel markers of pathology and provide insight into the relation between metals and brain structures in cognitive function. The research also aims at finding alternative, less invasive, and greener forms of identifying etiology of neurological conditions.

### Session F-2

#### Oral Presentation: Latina Health III

**Saturday, March 9, 2013, 10:45 am**

**Location:** Love Library 430

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**505 11:15 am**

**Temporal Order Memory Deficits in Huntington's Disease**

Ashley Emami, Psychology (U)

Paul Gilbert, Psychology

Temporal order memory was studied in patients diagnosed with Huntington's disease (HD) and matched controls. Participants completed a visuospatial temporal order memory task involving manipulations of the temporal separation between two spatial locations in a random sequence. Temporally proximal locations in the sequence were hypothesized to result in more interference compared to temporally distant locations. Both groups improved as a function of increased temporal separation. However, HD patients demonstrated significant impairments relative to controls, suggesting that temporal order memory is impaired in HD even when temporal interference is minimal. The findings identify a fundamental, yet relatively unexamined, processing deficit associated with HD.

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**506 11:30 am**

**Is X-ray Floreescence Imaging, a Valid Measure in Examining Differences in the Metal Concentrations of Postmortem and Resected Brain Tissue?**

Laura Frutos, Psychology (U)

Ann Lam

The human brain is abundant in metals, which are essential for healthy cognitive function. Changes to the levels of metals may result in neurological conditions as seen in various disruptions to the central nervous system. In this project, Synchrotron x-ray fluorescence (SXRF) imaging was used to examine the metal concentration of postmortem and surgically resected brain tissue.

The postmortem tissue was donated by individuals with Williams Syndrome (WS) and the resected tissue samples were obtained from individuals undergoing surgical resections to control pharmacoresistant epilepsy. SXRF imaging was conducted at the Stanford Synchrotron Radiation Lightsource. The technique has previously been used to study other human brain conditions including Parkinson's and Alzheimer disease. This is the first study to examine WS and resected epilepsy tissue. We have previously shown that SXRF is a sufficiently sensitive technique to distinguish concentrations and co-localization of metals in brain structures. However, the method is still under development and additional studies are necessary to further validate its usage as a quantitative method that can be applied to a larger spectrum of brain conditions and tissue preparations. To this end, we analyzed the concentration and distribution of metals in tissue samples over multiple trials to test whether the detection of metal levels is altered as a result of repeated exposure to the high energy x-rays used in the technique. We hypothesized that there will be no significant difference between the concentration of metals during trial runs when examined over a short period of time.

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perceptions of their self-worth predict depression in the general population (Sargent et al., 2006). The relationships between and among stress, depression, somatic symptoms, and self-worth in Latino/a undergraduate students are unclear, as is how acculturation, gender, and anxiety are related in this population. The purpose of this study is to examine depression, anxiety, stress, and somatic health problems among Latino/a college students with consideration of self-worth, acculturation, and gender. It was hypothesized that there would be positive correlations between and among depression, anxiety, stress, and somatic health problems in female and male Latino/a undergraduate students and that higher self-worth would predict lower levels of depression, anxiety, and stress. It was also expected that acculturation to mainstream-American culture would predict fewer somatic health problems among participants.

Participants were 165 female and 45 male Latino/a undergraduate students from Palo Verde College (PVC) or the Imperial Valley campus of San Diego State University (SDSU-IV). Both PVC and SDSU-IV are located in rural areas in southeastern California. Participants completed a survey packet that included demographic questions, the Medical Problems and Self-Worth subscales of the Codependency Assessment Tool (Hughes-Hammer et al., 1998), the 21-item version of the Depression, Anxiety, and Stress Scales (Lovibond & Lovibond, 1995), and the Acculturation Rating Scale for Mexican Americans, Second Edition (Cuéllar et al., 1985). For both genders, acculturation was not correlated with any other variable. Somatic problems, depression, anxiety, and stress were all positively correlated with one another and negatively correlated with self-worth among female and male participants. Multiple regression analyses indicated that stress and self-worth uniquely predicted depression among female participants whereas stress and somatic problems uniquely predicted anxiety. Among male participants, stress and somatic problems predicted depression and anxiety. Implications, limitations, and future directions will be discussed.

This study examined perceived family-of-origin experiences, depression, anxiety, and stress among Latino/a undergraduate students, with consideration of self-worth, acculturation, and gender. It was hypothesized that negative memories of family-of-origin relationships and events would predict lower levels of self-worth and higher levels of depression, anxiety, and stress in both female and male participants. Furthermore, it was hypothesized that acculturation to mainstream-American culture would be associated with participants' reports of familial problems and their depression, anxiety, and stress.

Participants were 160 Latina and 45 Latino undergraduate students from one of two institutions of higher education located in rural areas of southeastern California. In addition to a demographic questionnaire, participants completed the following instruments: the Family-of-Origin and Self-Worth subscales of the Codependency Assessment Tool (Hughes-Hammer et al., 1998), a modified version of the Children of Alcoholics Life-Events Schedule (Roosa et al., 1988), the 21-item version of the Depression, Anxiety, and Stress Scales (Lovibond & Lovibond, 1995), and the Acculturation Rating Scale for Mexican Americans, Second Edition (Cuéllar et al., 1985). Acculturation was positively correlated with male participants' reports of pleasant family-of-origin experiences; acculturation was not correlated with any other variable. Almost all family-of-origin variables correlated with self-worth, depression, anxiety, and stress in female participants; this pattern was not seen in male participants. Multiple regression analyses demonstrated that depression, anxiety, and stress were predicted by different combinations of self-worth and family-of-origin variables in female participants. In male participants, the number of negative family-of-origin events reported was the only predictor of depression, anxiety, and stress. Implications, limitations, and future directions will be discussed.

509 11:15 am

**Latino Undergraduates, Locus of Control and Mental Health**

Tara Perkins, Psychology (U)
Elizabeth Cordero, Psychology, IVC

The purpose of this study is to examine the role of locus of control and self-worth in the prediction of depression, anxiety, and stress in Latino/a undergraduate students, taking into account gender and acculturation. Undergraduate students with severe depressive symptoms report experiencing past events that they perceived as more personally uncontrollable in nature than less depressed individuals (Markman, 2006). Moreover, Sargent (2006) found that external contingencies of self-worth, such as peer approval, contribute to the development and/or maintenance of depressive symptoms in incoming undergraduate freshmen. Unfortunately, there is insufficient research about how locus of control and self-worth relate to depression, anxiety, or stress among Latino/a undergraduate students. Therefore, it was hypothesized that:

1) Latino/a undergraduate students who report higher internal
loci of control will report lower levels of depression, anxiety, and stress; 2) Latino/a undergraduate students who report higher levels of self-worth will report lower levels of depression, anxiety, and stress; and 3) acculturation to mainstream-American culture would be positively correlated with internal locus of control.

Participants were 160 Latina and 45 Latino undergraduate students from Palo Verde College or the Imperial Valley campus of San Diego State University. Participants completed a packet with demographic questions and the following scales: the Personal Efficacy subscale of the Spheres of Control scale (Paulhus, 1983), the Self-Worth subscale of the Codependency Assessment Tool (Hughes-Hammer et al., 1998), the 21-item version of the Depression, Anxiety, and Stress Scales (Lovibond & Lovibond, 1995), and the Acculturation Rating Scale for Mexican Americans, Second Edition (Cuéllar et al., 1985). Locus of control, self-worth, depression, anxiety, and stress were correlated as hypothesized within women. Within men, however, internal locus of control was only correlated (negatively) with depression. Acculturation was not correlated with any other variable in either gender. The results of multiple regression analyses indicate that locus of control and self-worth uniquely contributed to the prediction of depression, anxiety, and stress among women. Locus of control and self-worth also uniquely contributed to the prediction of depression in men. Implications, limitations, and future directions will be discussed.

**510 11:30 am**

*Weight Cycling and its Psychological Effect on Mexican American women*

Annalia Valdivia, Psychology (U)
Linda Gallo, Psychology

Background: Weight cycling, or experiencing repeated periods of weight loss and gain, is common among the U.S adult population. Weight cycling is hypothesized to be a risk factor for obesity and to have harmful metabolic, behavioral and health consequences. In addition to epidemiological patterns indicating that weight cycling may increase the risk of cardiovascular disease, concerns have been raised that weight cycling may do psychological harm. Minimal research has examined the effects of weight cycling in relation to psychological well-being in Mexican American women. The purpose of the current study was to investigate the association between self-reported weight cycling and selected psychological factors including, depression, anxiety, anger and stress in healthy, middle-aged Mexican-American women. It was hypothesized that women who reported weight cycling would be more likely to report higher levels of these psychological factors.

Methods: A random sample of 314 Mexican American women aged 40-65 (M=49.8, SD=6.6) living in the California/Baja-California border region of the US completed questionnaires (in English or Spanish) including measures of socio-demographic factors, health history, and psychological distress (i.e., negative emotions, perceived stress). Weight cycling was assessed by asking respondents how many times did their weight go up and down by more than 10 pounds, excluding the times when they were pregnant or sick. Hierarchical linear regression analyses were conducted to examine the association between self-reported weight fluctuation and depression (Center for Epidemiological Studies–Depression Scale), anxiety (Spielberger Trait Anxiety Scale), anger (Spielberger Trait Anger Scale) and chronic stress, after controlling for BMI.

Results: Regression analyses showed that women who reported greater weight fluctuations had significantly higher levels of depression (β=0.25, p =0.001), anxiety (β=0.21, p =0.001), anger (β=0.15, p =0.001) and chronic stress (β=0.14, p =0.001), after controlling for BMI.

Conclusion: Findings demonstrated that weight cycling was significantly associated with increased depression, anxiety, anger and chronic life stress. As a result of these health implications, future interventions should focus on addressing weight cycling and weight maintenance, irrespective of BMI. One limitation of the study was its cross-sectional design precluding causal or directional conclusion regarding the associations among weight cycling and psychological well-being.

**Session F-3**

**Oral Presentation:**

*Solar Energy and Nuclear Physics*

Saturday, March 9, 2013, 10:45 am

**Location: Love Library 431**

**511 10:45 am**

*Environmental and Biological Impacts of Nuclear Energy and Radiation Exposure*

Anastasiya Irkhin, Environmental Sciences (U)
Patrick Papin, Physics

Nuclear Energy is a controversial topic with profound implications for potential risk to public health and safety. However, climate change and greenhouse gas emissions have lead the quest for a cleaner fuel source, bringing back the potential use of nuclear energy generation as a significant energy source. Although there is a possibility for high production of energy from nuclear power, radiation exposure events such as Fukushima and Chernobyl suggest that analyzing the effects of radiation exposure on the environment is a high research priority. Specifically, we need to better understand the biological effects of nuclear energy exposure to the environment. The effects of radiation doses from nuclear energy to humans and the surrounding landscape are very important to understand in order to proceed with implementing increased nuclear energy use as a carbon-less
energy source. Addressing the outcomes from stabilizing use of this source of energy, as well as understanding its potential radiation effects has significant implications to the public health, homeland security, and to international relations. This research brings together methods used in radiation transport, radiation detection and measurement, and radiological assessment, while integrating environmental monitoring and landscape-level assessments. Implementing and establishing methods at San Diego State University will contribute to measurement and assessment capabilities. The assessment capabilities will involve collaborations between Radiological Physics Laboratory and the Visualization Center. The outcome will identify a path forward for nuclear energy in the United States, and help us understand national security issues, and human and environmental health impacts from using nuclear energy.

512  11:00 am

**Fluid Flow and Radiative Heat Transfer Modeling of a Small Particle Solar Receiver**

Pablo Fernandez del Campo, Mechanical Engineering (U)
Fletcher Miller, Mechanical Engineering

We present an investigation of the effects of the solar irradiation and mass flow conditions in the behavior of a Small Particle Solar Receiver employing our new and exhaustive coupled fluid flow and radiative heat transfer model. This research expands on previous work conducted by our group and utilizes improved software with a set of new features that allows performing more flexible simulations and obtaining more accurate results. For the first time, it is possible not only to predict accurately the overall efficiency of the solar receiver and the walls temperature, but also to see the effect on the receiver of the window, the outlet tube, realistic solar irradiations, non-cylindrical geometries and 3-D effects. This way, a much better understanding of the receiver’s capabilities is obtained. While the previous models were useful to observe simple trends, this new software is complete, flexible and accurate enough to act as a design and optimization tool for the actual receiver.

The solution procedure relies on the coupling of the CFD package ANSYS Fluent to our in-house Monte Carlo Ray Trace (MCRT) software. On the one hand, ANSYS Fluent is utilized as the mass-, momentum- and energy-equation solver and requires the divergence of the radiative heat flux, which constitutes a source term in the energy equation. On the other hand, the MCRT software calculates the radiation heat transfer in the solar receiver and needs the temperature field to do so. By virtue of this coupled nature, both codes should feed each other back and iterate until convergence. The coupling between ANSYS Fluent and our in-house MCRT code is done via User Defined Functions. After developing the mathematical model, setting up the software and optimizing the coupled solution procedure, the receiver has been simulated under different solar irradiations and mass flows cross combinations. The behavior of the receiver at different times and the optimum mass flow as a function of the solar input are presented.

513  11:15 am

**An Experimental X-ray Source Characterization Method for Dosimetry Simulations in CT**

Mitch Sommerville, Medical Physics (M)
Mauro Tambasco, Physics

Purpose: To show that the nominal peak tube voltage potential (kVp) and measured half-value layer (HVL) are sufficient to generate energy spectra and 2-D fluence arrays for fast and accurate patient and machine-specific dose computations in Computed Tomography (CT).

Methods: The source was characterized by measuring HVL in air across the bowtie profile and using third-party software Spektr to generate the spectra. The dose calculations were performed using a previously validated in-house hybrid deterministic and stochastic kV x-ray dose computation algorithm (kVDoseCalc). To ensure dose convergence while minimizing calculation time, we examined the sensitivity of kVDoseCalc to the number of photons seeded. We modeled the source for a Philips Brilliance Big Bore CT scanner to experimentally validate our source characterization method for 90 kVp, 120 kVp and 140 kVp. Doses measured using a Farmer-type Capintec ion chamber (0.06 cc) placed in a cylindrical poly methyl methacrylate (PMMA) phantom were compared to those computed in kVDoseCalc.

Results: The average percent difference between calculation and measurement pooled over all 12 positions in the phantom was determined to be 1.9 %, 1.3 % and 1.0 % for 90 kVp, 120 kVp and 140 kVp, respectively. The maximum percent difference between calculation and measurement was less than 4.5 % pooled over all energies and measurement positions. The uncertainty in dose measurement reproducibility was added in quadrature to the uncertainty associated with the ion chamber’s active volume, which was modeled computationally. These results were within the total experimental uncertainty.

Conclusion: Our source characterization technique, which derives incident fluence and spectra from measurements of HVL across the bowtie profile, is sufficient for patient and machine-specific CT dose calculations.
ABSTRACTS

514 11:30 am
Thermal Radiation Modeling and Optical Analysis of a Window for Small Particle Solar Receiver Using the Monte Carlo Ray Trace Method
Ahmet Mecit, ME (M)
Fletcher Miller, Mechanical Engineering

Concentrated solar power (CSP) systems use heliostats to concentrate solar radiation in order to produce heat, which drives a turbine to generate electricity. We are developing a new type of receiver for power tower CSP plants based on volumetric absorption by a gas-particle suspension. The radiation enters through a window, which must sustain the thermal loads from the concentrated flux and reradiation from inside the receiver. The window is curved to withstand the pressure within the receiver and help minimize the stresses caused by thermal loading. It is highly important to estimate how much radiation goes through the window into the receiver and the spatial and directional distribution of the radiation. These factors play an important role in the efficiency of the receiver as well as window survivability.

Concentrated solar flux was calculated with a computer code called MIRVAL from Sandia National Laboratory which uses Monte Carlo Ray Trace (MCRT) method. The computer code is capable of taking the day and time of day into account, which causes a variation in the flux. Knowing the concentrated solar flux, it is possible to calculate the solar radiation through the window and the thermal loading on the window from the short wavelength solar radiation.

Optical properties of the window such as the transmissivity, absorptivity, and reflectivity need to be known in order to trace the rays at the window. A computer code was developed to calculate the optical properties depending on the incident angle and the wavelength of the incident radiation by using data for the extinction coefficient and refractive index for the window (quartz) from other studies.

Another code was developed by using the MCRT method and coupled with both codes mentioned above to calculate the thermal load on the window and the solar radiation that enters the receiver. Thermal loading was calculated from energy absorbed at various points throughout the window. In our study, window shapes from flat to concave hemispherical, as well as a novel concave ellipsoidal window are considered, including the effect of day of the year and time of the day.

515 11:45 am
Two Dimensional, Spectral Thermal Analysis of a Planar Window Used in a Solar Thermal Receiver
Alex Whitmore, Thermal Sciences (M)
Fletcher Miller, Mechanical Engineering

SDSU’s Solar Project is designing and building a solar thermal receiver which uses small particles of carbon in air to capture the solar input. This type of receiver is called a Small Particle Heat Exchange Receiver (SPHER). The SPHER is a cavity with suspended air particles heating up as they flow through it. SDSU’s SPHER is designed for five megawatts of electrical power with solar flux concentrations upwards of four thousand suns. The expected operating temperature of the receiver is 1000°C with an internal pressure of 80 psi. A 1.7 meter diameter fused quartz window is used to allow the solar radiation to enter the receiver while also maintaining the internal pressure. One of the largest technical challenges is preventing the window from cracking and/or blistering due to overheating. Therefore a maximum window temperature of 800°C is needed.

The temperature of the window is analyzed by an energy balance between the solar energy absorbed, the energy absorbed from the receiver’s thermal radiation, the thermal radiation emitted from the window, the liquid cooled outer mounting ring, and convection on both sides of the window. In cylindrical coordinates, a planar two dimensional finite difference code written in FORTRAN for this research is used to balance the energy. The solar input flux is modeled as normal, collimated light using NREL’s Airmass 1.5 spectral flux data. The material/radiation properties of the fused quartz were taken from literature values. The two dimensional finite difference energy solver code was validated against both numerical and analytical one dimensional solutions to verify it was working correctly.

By the use of a liquid cooled mounting ring and forced convection on the window’s surfaces, the temperature of the window is able to be held below 800°C. The effects of the solar concentration factor, the outer ambient convection coefficient, the interior receiver convection coefficient, cooling ring temperature and window thickness are determined. Graphs of the windows temperature, temperature gradients, absorptivity vs. wavelength, and the solar flux absorbed vs. the depth. A fused quartz window is a viable solution for pressurized solar receivers with solar concentration factors of 4000 when actively cooled.
Session F-4
Oral Presentation: Philosophical Inquiries
Saturday, March 9, 2013, 10:45 am
Location: Love Library 410

516  10:45 am
A Physicalist’s Response to the Knowledge Argument
Brett Castellanos, Philosophy (U)
Robert Francescotti, Philosophy

My research focuses on defending a physicalist concept of mind while acknowledging the epistemic problems entailed by such a concept. One argument against physicalism is presented in “Epiphenomenal Qualia” by Frank Jackson. The Knowledge Argument illustrates that a complete physical description of a mental process (i.e. color sensation) does not confer a complete knowledge of that mental process. Therefore, physicalism must be false. I argue that on the contrary even if his premise is true it is not sufficient to refute physicalism. In fact the epistemic gap that the Knowledge Argument relies on is completely coherent with a physicalist concept of mind and to be expected.

517  11:00 am
Kierkegaard: Regarding the Three Stages of Life
Brian Thomas, Philosophy (U)
Steven Barbone, Philosophy

In his philosophy, Søren Kierkegaard proposes three stages of life: the Aesthetic, the Ethical and the Religious. In this paper, I propose a two part thesis: first, one is able to find these stages in Kierkegaard’s work Fear and Trembling, more specifically, in the section titled “Attunement.” Second, I argue, the Hegelian dialectic may be applied to the three stages. To develop my thesis, I provide a house building analogy. The analogy consists of: clearing the land/area for the foundation. This part of the analogy is represented in the summary of “Attunement.” The next part of the analogy consists of identifying and gathering the tools necessary for construction. This would be defining the three stages individually. Next, building the skeleton, walls and insulation. This is represented in the analysis of “Attunement” and discovering the three stages in “Attunement.” The last step is to furnish the newly constructed house. This final step is represented by: explaining Hegel’s dialectic and applying it to the three stages. Not only can we understand Kierkegaard’s three stages of existence via the Hegelian dialectic, but we can also see them in practice in the four different accounts of the story of Abraham and Isaac Kierkegaard provides in “Attunement.”

518  11:15 am
A Unified Theory of Ethics
Rashed Ahmad, Philosophy (U)
Steven Barbone, Philosophy

In this essay, I argue that by unifying utilitarianism, negative utilitarianism, Kant’s second formulation of the categorical imperative, and sentimentism, we can come up with a moral theory, a unified theory of ethics, which solves the objections that these other theories have. I provide possible objections, and I show how they could be solved by this proposed theory. However, this theory does not command or oblige anyone to follow it because, as I explain, there is no free will and there are no obligations; this theory simply explains how we can know what is morally right and what is morally wrong. This theory also does not acknowledge intentions because, as I show, intentions do not matter to what the action really caused. This unified theory of ethics has a clear flowchart that makes it easy to know whether the action is morally right or morally wrong.

519  11:30 am
Buddhist Philosophy as a Testable Hypothesis
James Shohfi, Philosophy (M)
Sandra Wawrytko, Philosophy

Buddhist philosophy claims that we are endowed with an innate capacity for great compassion, joy, love, and equanimity. It claims that this, our Buddha Nature, can be awakened and realized through specific ethical and meditative practices. The Buddha himself encouraged empirical investigation of his claims. I will frame these claims of Buddhist philosophy as a testable hypothesis and explain their dynamics in terms familiar to students of Western psychology and Western philosophy. The idea of Buddha Nature is based on the Buddha’s teachings regarding an innately pure and luminous original mind that has become defiled. My presentation centers on the cause of our predicament in terms of a progressive dissociation from primordial Buddha Nature, and the remedy in terms of ethical and meditative practices that can reset our default unspoilt condition through direct experience of non-duality and clear observation. The Buddhist view asserts that when we discover the truth of non-separation, we’re relieved from a fundamental anxiety about the experiences of life. Our natural state becomes a fulfillment of Buddhism’s Four Immeasurables—love, compassion, joy, and equanimity. Direct experience of non-duality awakens the non-discriminating mind, and compassion is the natural result. Transcendence of discrimination between sentient beings results in broad, or even universal, extension of the natural compassion that is usually felt only for one’s closest kin. Buddhist prescriptions of appropriate conduct are considered to be training rules that the aspirant voluntarily adopts because of their instrumental function of facilitating realization of non-duality and
Buddha Nature. I summarize Buddhism’s training rules of conduct under two general categories, authenticity and benevolence, and explain how these training rules facilitate the realization of Buddha Nature through reinforcement of interconnectedness and removal of hindrances to meditation. The functions of two core meditative practices common to all schools of Buddhism are described. Western psychology’s research and theoretical perspectives are drawn into my explication of the benefits of meditation and clear observation in terms of deautomatization and shifting towards a less mediated awareness.

520 11:45 am
Does Hybrid Minimalist Theism Make a Difference?
Jake Borcher, Philosophy (M)  
J. Angelo Corlett, Philosophy

In his book, The Errors of Atheism, Dr. Corlett offers a new interpretation of the concept of God. He argues that the traditional notion of God has been faced with substantial problems that provide very good reason to reject this position. Corlett also argues that atheists are hardly justified in thereby declaring that we ought to accept the claim that God does not exist. He suggests that before the question of God’s existence is considered settled the atheist ought to seriously engage with non-traditional ideas of God. Only if the most promising of these ideas is also found problematic will we be justified in asserting that God does not exist.

Corlett’s suggested non-traditional theism is called hybrid minimalist process-liberationist theism. This combines in a novel way the process idea of God as a being less than omnipotent who influences and inspires people to bring about the good, and the liberationist idea of God as justice working in the world through people who follow his will to promote the well-being of other humans and to liberate the oppressed.

I will argue that this hybrid minimalist theism is not significantly different than a similar but equally coherent atheistic and humanistic ethic. I have researched both process and liberationist ethics and atheistic alternatives. I believe that a comparable theoretical and practical morality can be devised with equal objectivity and justification for a suitably inclined atheistic humanist that does not include any reference to a hybrid minimalist God. My argument for this is based largely on the famous Euthyphro Dilemma, where Socrates asks whether the good is good because it is loved by the gods or the good is loved by the gods because it is good. Thus the stripped down and minimalized conception of God in Corlett’s theism does not make a relevant difference.

Session F-5
Oral Presentation: Antennas and Receivers
Saturday, March 9, 2013, 10:45 am
Location: Love Library 260

521 10:45 am
The study of the effects of different loading armor materials on the spiral antenna
Phu Tran, Electrical Engineering (M)  
Satish Sharma, Electrical and Computer Engineering

In modern military communication applications, the desire capabilities of an antenna for the effective system are mobility, broadband, and high survivability. For such systems, the broadband spiral antenna is generally designed to provide solution to meet these requirements. The spiral antenna is fully utilized from its broadband and circular polarization characteristics for systems of where space is limited and all the communication frequency bands are required to be function with one antenna. To survive in harsh environment for military applications, the antenna must also be housed and protected by armor materials. The different dielectric materials loading on the spiral antenna can negatively impact the overall performances. The purposes of my research are to study the effects of different loading armor materials on the spiral antenna and to optimize the spiral antenna to preserving its broadband and circular polarization characteristics.

522 11:00 am
Investigations of Wideband Microstrip E patch antenna array on Curved Surfaces
Anusha Kalikonda, Master of Engineering (M)  
Satish Sharma, Electrical and Computer Engineering

Body wearable antennas are getting tremendous attention recently which not only can offer reduced electronic devices that one has to carry but also cost saving. Though in early days, its major application was for Military communication, these days they can be integrated into various outfits like in sports, hospital emergency outfits and other modes of communication. In this research, a microstrip ‘E’ shaped patch antenna is designed which covers wide bandwidth ranging from 2.2GHz to 3GHz which covers several wireless communications bands. As antennas are integrated in our clothing, observing the behavior of antenna on different curved surfaces is essential. Initially a single E patch is designed on flat surface and then it is investigated on different curved surfaces. To improve the gain performance and make the radiation more directional, an 1 by 4 array is also investigated made in the same process on different curvatures. Both simulated and measured results will be presented during the symposium.
**523  11:15 am**

**A Circularly Polarized Multimode Patch Antenna with Full Hemispherical Null Steering for GPS Applications**
Nathan Labadie, Electrical Engineering (D)
Satish Sharma, Electrical and Computer Engineering

Pattern reconfigurable antennas offer an additional degree of freedom in the design of communications systems with which to mitigate potential threats in the electromagnetic environment. GPS receivers are notoriously susceptible to low power jammers and benefit from the use of reconfigurable null forming antennas. One approach is to excite N orthogonal radiating modes on collocated elements and use phase and amplitude weighting to scan N-1 beam peaks and nulls. We propose a novel circularly polarized multimode patch antenna capable of main beam and full hemispherical null steering. The required active feed network is also investigated.

**524  11:30 am**

**Frequency Agile Polarization Reconfigurable Varactor Loaded Microstrip Circular Patch Antenna**
Behrouz Babakhani, Computational Science (D)
Satish Sharma, Electrical and Computer Engineering

A frequency agile polarization reconfigurable dominant mode (TM$_{11}$) microstrip circular patch antenna by implementing varactor diodes has been investigated. Frequency agility from 1.79 GHz to 1.46 GHz has been achieved with acceptable radiation performance by varying four varactor diodes capacitance from 1.32 pF to 9.36 pF. Considering two input ports for the patch antenna, polarization reconfiguration has also been implemented. This antenna has the capability to switch from right hand circular polarization (RHCP) to left hand circular polarization (LHCP). Besides, exciting one port at a time, horizontal linear and vertical linear polarizations are also investigated. Additional results will be presented during the symposium.

**525  11:45 am**

**An Efficient Symbol Timing Recovery Method Based on Polyphase Perfect Reconstruction Channelizers**
Xiaofei Chen, Electrical Engineering (D)
Fred Harris, Electrical and Computer Engineering

In this paper a novel timing recovery circuit for wideband digital receivers is presented. The proposed architecture is based on non-maximally decimated filter bank (NMDFB) with perfect reconstruction (PR) property, which implements digital matched filter (MF), fractional delay filter (PDF) as well as derivative filter (DF). The main advantage of the proposed structure is to allow the hardware to operate at lower processing rate, which is a desired property for wideband receivers. Theoretical analysis and Matlab simulations are provided to demonstrate the effectiveness of the proposed approach.
527  11:00 am
No Title Provided
Racha Lwali, Aerospace Engineering (U)
Larry Hinkle, Aerospace Engineering and Engineering Mechanics
This project is set to compare the influence of the bullet geometry on the aerodynamic drag of a Spitzer-type bullet. In particular, the relationship between the frustum lengths of the different designs will be considered as the governing parameter in the aerodynamic changes.

528  11:15 am
Using a mobile phone to launch a liquid fueled rocket
Travis Wyatt, Aerospace Engineering (U)
Carl Tedesco
SDSU Rocket Project is a student lead initiative to design, build, and launch experimental liquid fueled rockets. With the assistance of a local company, Flometrics, Rocket Project has launched 5 rockets since 2003. Last semester a rocket was successfully launched to an altitude of 10000 ft. at speeds upward of 500 miles per hour.

The Rocket Project is programming an Android phone to control various parts of the rocket’s launch/flight procedure, namely igniting the rocket and initiating the deployment of recovery parachutes. Various sensors will be utilized to collect data and have the rocket react accordingly. Wireless capabilities of the phone will also be used by the team to provide real time remote access to data collection and control systems during the time leading up to the rocket launch.

529  11:30 am
Preparing SDSU’s Low Speed Wind Tunnel for Subsonic Flow Testing of Turbine Inlet Guide Vanes
Ricardo Torres, Aerospace Engineering (M)
Gustaf Jacobs, Aerospace Engineering & Engineering Mechanics
We present on a design modification of SDSU’s Low Speed Wind Tunnel that enables testing of the Inlet Guide Vanes (IGV) in Solar Turbines’ industrial gas compressor at their low-subsonic operating conditions. The maximum velocity achievable in the existing tunnel is 180 MPH. This is below the operating condition within the compressors IGV. To increase the velocity magnitude in the existing tunnel to 250 MPH we design and manufacture a converging/diverging insert that retro-fits into the wind tunnel without modification of the motor or propeller. We perform control volume engineering analysis and Computational Fluid Dynamics analysis with Fluent software to determine sizing of the insert. Sizing and design criteria are based on the pressure and velocity distribution in the tunnel that prevents significant flow separation and pressure losses. The objective of the structural design is a safe load-bearing insert with a structurally sound frame and sufficient frame thickness. A stress analysis is performed with FEMAP/NASTRAN, a structural design software to ensure material stresses do not cause failure. The insert is manufactured with Aluminum L-Brackets, Cabinet Grade Plywood and Plexiglas. Wind tunnel calibration tests confirm that the velocity in the test section increases from 180 MPH to 250 MP, setting the stage for testing of the IGVs.

530  11:45 am
High fidelity numerical computation of finite time Lyapunov exponents using spectral element methods
Daniel Nelson, Aerospace (D)
Gustaf Jacobs, Aerospace Engineering & Engineering Mechanics
Lagrangian Coherent Structures (LCS) theory is proving to be a useful and versatile method for elucidating the topologies of complex turbulent separated flows. By measuring the fluid stretching rate via finite-time Lyapunov exponents (FTLE), we can identify fluid boundaries where the stretching rate is locally maximal (i.e. repellers) when the FTLE field is calculated forward in time. Additionally, we can identify attractors in the flow when the FTLE field is computed backward in time. This work focuses on computing FTLE’s using discontinuous Galerkin spectral element methods to achieve high-order accuracy on complex domains. Furthermore, we use spectral element flow solvers and integrate the FTLE determination method directly into the flow solvers to allow on-the-fly LCS detection. A method for determining the backward-time FTLE using the forward time data and high-order interpolation is also presented. The method is validated with a benchmark of a vortex convected in uniform flow and the flow around a square cylinder.
METHODS: MI calls were conducted via telephone by promotoras (lay health advisors) trained in delivering a modified version of Resnicow's MI call protocol. The goal of the MI calls was to increase PA outcomes: PA in the week prior to the call and exercise class attendance during the three months following the call. Promotoras attempted to reach 80 Latinas participating in waves 1-3 of the intervention. The first call was conducted three months after the start of the intervention and the second call followed 3-4 months later. RESULTS: Most participants completed call one (89%) and call two (69%). Completing the second call was positively related to class attendance (p < 0.001). Improved health was the most frequently reported benefit of PA. The number of benefits mentioned during the first call was significantly related to the number of PA days reported (p < 0.032), though this relationship was not significant in the second call. In both calls, lack of time was discussed by 50% of participants as a barrier to doing PA. Other frequently discussed barriers included work, household chores/childcare, health conditions, and lack of effort/motivation. While the average number of barriers decreased in the second call, the number and type of barriers were not significantly related to PA outcomes. The most frequently reported values discussed during both calls were spirituality, health, and spiritual service. However, these were not related to PA. CONCLUSION: Describing the benefits of PA was only significant in the first call, perhaps because knowledge is limited in creating behavior change. Barriers and values were reported by most participants, regardless of their PA level, thus possibly affecting their relationship with PA outcomes. However, the second MI call was positively related to PA, suggesting that promotoras are successfully using participants' benefits, barriers, and values, to create behavior change.

532 11:00 am

Utility Bicycling as Part of a Sustainable Urban Policy and Public Health Policy

Jefferson Gamoning, Public Administration (M)
Shawn Flanigan, Public Affairs

A Fulbright Scholarship during the 2011-2012 academic year was spent in Seoul, South Korea exploring utility bicycling as part of a sustainable urban policy and public health policy. Seoul, like many large, densely populated cities, suffers from traffic congestion (primarily vehicular). In addition, the cost of living in cities is relatively high compared to suburbia or the countryside. Lastly, the lack of daily exercise can contribute to long-term health problems, taxing the public health system. Utility bicycling was explored as a means to ameliorate some of the adverse health, financial, and physical conditions of urban life. The bicycling policy of the Seoul Metropolitan Government, in addition to unique geographical characteristics, has led to the creation of an extensive bicycling network. The recommended 30 minutes of daily exercise is often difficult to achieve but by incorporating bicycling to execute daily tasks, such as going to the post office, market, etc, one not only benefits from the exercise but also accomplishes errands at minimal transportation cost and harm to the environment. This is what is referred to in business terms as the triple bottom line, actions that are good for society, the environment, and the financial bottom line.

This study, through visual observation, indentified projects and infrastructure conducive to utility bicycling, weaknesses in existing urban policy, and recommended changes to improve and promote utility bicycling.

533 11:15 am

Testing the Role of Physical Acceptance in the Exercise and Self-Esteem Model in College Students

Kayli Dalton, Exercise Physiology & Nutritional Sciences (M)
Susan Levy, Exercise and Nutritional Sciences

Objective: To examine the proposed mediating relationships of the exercise and self-esteem model (EXSEM) over time and the role of physical acceptance in the college population. Participants: Eight-five freshmen undergraduate male (n = 25; M age = 18.0 years; SD = 0.5) and female (n = 60; M age = 17.8 years; SD = 0.4) students. Methods: Participants completed valid and reliable self-report measures of exercise self-efficacy, physical competence, physical acceptance, and global self-esteem pre- and-post an 8-week time period. Results: Regression analyses supported the proposed mediating relationships of the EXSEM. An additional relationship was found to exist where physical acceptance mediated the influence of exercise self-efficacy on global self-esteem. Together, change in exercise self-efficacy and physical acceptance explains 23% of the variability in global self-esteem. Conclusions: These findings support the inclusion of physical acceptance and its importance in the exercise and self-esteem relationship in college students. Additional relationships that those first proposed within the EXSEM were found. Further study is needed to examine these additional relationships, as well as how exercise contributes to improvement in physical self-perceptions, especially in the college-aged population.
Session F-8

Oral Presentation:
Graduate Research in Exercise and Kinesiology
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 78

534 10:45 am
Validity and reliability of a customized Wii Balance Board to improve objectivity of the BESS test
Jasper Chang, Kinesiology (M)
Daniel Goble, Exercise and Nutritional Sciences

A large contributor to the growing concussion epidemic is sport-related concussion. Measures obtained from balance testing are thought to remove some of the subjectivity associated with concussion testing based only on symptomology and/or cognitive assessment batteries. The Balance Error Scoring System (BESS) has been proposed as an affordable alternative to sophisticated postural stability assessment tools such as a force plate (FP). While the BESS is designed to be a portable, cost-effective and quantifiable method for assessing balance, the possibility of human error based on a clinician’s experience with using the BESS may lead to differences in error identification. It has been demonstrated that an inexpensive (~$50) Nintendo Wii Balance Board (WBB) might serve as a reasonable proxy for a force platform. Reprogramming the WBB for clinical purposes is within reach and could increase access to sports medicine practitioners and provide the average clinician with a more objective standing balance assessment tool for the clinical setting. To validate this, center of pressure (COP) data regarding body sway was collected concurrently from a FP and customized WBB setup as participants completed the BESS balance conditions across 2 days separated by one week. Significant correlations (~0.99) were found in COP path length for FP and WBB in all conditions of the BESS. The traditional BESS method had only moderate correlations for the composite scores compared to the FP. The WBB measures were also more reliable than the standard BESS when comparing scores across multiple sessions on different days. These findings suggest that an objective balance assessment device is feasible in settings where expensive and sophisticated balance assessment devices do not exist, and with clinicians that are less experienced with using the BESS postural assessment. Key words: Balance, Force plate, Posture

535 11:00 am
Effects of a Six-Week Wii Balance Training Protocol on Dynamic Balance
Jacob Schwartz, Kinesiology (M)
Daniel Goble, Exercise and Nutritional Sciences

Background: Falls in older adults are commonly the result of poor balance. Such falls can be dangerous, costly, and even fatal. It is now known that balance performance can be trained, including the dynamic control component, which is integral to maintaining balance while moving through space. One means of balance training that has recently gained popularity is that of the Wii Fit gaming system.

Purpose: The purpose of this study was to assess the effectiveness and feasibility of a Wii Fit-based balance training protocol. In particular, we hoped to determine 1) to what extent Wii Fit training improves performance on a test of dynamic balance control, and 2) whether the effect of training is translatable in all movement directions (i.e., left/right and front/back).

Methods: Fifteen young, healthy individuals were assigned to a six-week Wii Balance training protocol consisting of seven different games with varying levels of difficulty. Dynamic balance was measured and analyzed both before and after training using the NeuroCom Balance Manager device. Specifically, the Limits of Stability (LOS) test was utilized, which requires participants to shift their center of pressure as far as possible towards eight different directional targets. Five different facets of dynamic balance were assessed including directional control, maximum and end-point excursions, reaction time, and maximum velocity. In addition, a control group of ten healthy individuals was tested on the LOS in the absence of training.

Results: 1) The Wii Training group showed greater improvements from the pre-to-post test conditions in all of the aforementioned criteria, relative to the non-trained controls. 2) The training effect was fully generalizable to all movement directions.

Conclusions: These findings support the notion that balance training is an effective tool in improving all facets of dynamic balance in young, healthy individuals in all movement directions. Additional research is required to determine whether the same effect is seen in elderly, unhealthy populations, as they are most likely to suffer from loss of balance and falls.
ABSTRACTS

536 11:15 am

Estimating Daily Bicycle Volumes Across a Community Roadway Network
Caleb Schroeder, City Planning (M)
Sherry Ryan, City Planning

Urban planning and public health researchers are becoming increasingly aware of the linkages between health and the built environment. Bicycling is viewed as one way to utilize the built environment to promote healthy lifestyles and combat the growing transportation issues facing the United States. However, there is a lack of research regarding methods to adequately analyze cycling patterns in support of long range planning for bicycle infrastructure.

Without access to daily bicycle volumes it is difficult to plan for or track bicycle use. Acknowledging this, the County of San Diego Health and Human Services Agency (HHSA) partnered with San Diego State University’s Active Transportation Research (ATR) center and the San Diego Association of Governments (SANDAG) to fund the installation of twenty six automated bicycle counters throughout San Diego County, creating the largest regional network of automated bicycle counters in the nation.

We developed an innovative approach to estimating daily bicycle volumes along a community roadway network using a combination of peak period manual counts and 24 hour, continuous automated counts in the Mid City neighborhoods of San Diego. We assessed peak period usage patterns at different locations to extrapolate the manual counts into daily bicycle volumes. The purpose of combining manual and automated count data was to establish a bicycle volume estimation for Mid City roadways. This type of comprehensive, community wide information related to cycling levels has never been available to transportation planners. This research therefore serves to fill the gap in knowledge regarding bicycling activity. Applying our methodology will allow for better decisions to be made throughout the region in relation to bicycle network implementation as well as quantifying the health and transportation benefits of cycling.

537 11:30 am

Impaired balance control in Autism Spectrum Disorders is correlated with neuropsychological measures of symptom severity
Sarah Kirtland, Kinesiology: Rehabilitation Science (M)
Daniel Goble, Exercise and Nutritional Sciences

Background: One in every eighty-eight children is affected by Autism Spectrum Disorders (ASDs), a group of developmental impairments characterized by abnormal cognitive, social, communicative, and motor abilities. With respect to motor function, comprehensive tests of motor aptitude have all reported motor deficiencies in individuals with ASDs as compared to typically developing (TD) children, especially in the subcategory balance control. Despite this, discrepancies exist regarding what balance control subtypes are of greatest concern. Identifying relationships between balance impairments and ASD indices of severity is also necessary to indicate how poor balance is related to ASD diagnostics.

Purpose: The present study determined if static balance control differed between age-matched ASD and TD children and adolescents (aged 6-18 years) during four increasingly difficult balance control situations. Balance scores for ASD participants were correlated with neuropsychological diagnostic measures (the Autism Diagnostic Observation Schedule (ADOS), Social Responsiveness Scale (SRS), and Repetitive Behavior Scale-Revised (RBS-R)).

Methods: Thirteen children and adolescents with ASD (mean age = 14.77 ± 2.74 years) and thirteen TD, age-matched controls (mean age =15.46 ± 2.07 years) were recruited. The Nintendo Wii Balance Board was used as a portable force plate to collect center of pressure (COP) sway data during four increasingly difficult static conditions: eyes open and closed double and single stance. ADOS-R, SRS, and RBS-R scores were correlated with balance control measures to identify potential relationships.

Results: ASD participants exhibited inferior balance control (p<0.05-0.01) as compared to TD participants during single stance conditions, particularly with eyes closed. Moderate to high correlations (r=0.523-0.773) were observed between balance control measures and subtests of the ADOS, SRS, and RBS-R.

Conclusions: The balance task results indicate that while ASD and TD participants possess similar balance control in double stance conditions, ASD participants may have greater difficulty with balance when single stance positions are required. Correlational results indicate that poor balance is associated with symptom severity in ASD. These findings could be of significant clinical importance in developing targeted interventions for balance and sensorimotor difficulties in individuals with ASD. Further research using imaging measures to identify functional networks modulating balance and sensorimotor/repetitive behaviors could also be of value.

538 11:45 am

Proprioceptive neuromuscular facilitation (PNF) produces dramatic, temporary improvements in elbow flexor spasticity
Tomas Gonzales, Kinesiology (M)
Daniel Goble, Exercise and Nutritional Sciences

Background: Spasticity is a neurological symptom that causes a velocity dependent increase in muscle tone when affected muscles are stretched. The presence of spasticity may impair the performance of activities of daily living by encumbering goal-directed movements and causing physical discomfort. For
this reason, the development of effective spasticity treatments is essential in order to improve the lives of affected individuals. Proprioceptive neuromuscular facilitation (PNF) is a physical therapy technique that has been used to treat spasticity. However, while generally believed to improve spastic symptoms, the degree of PNF’s effectiveness is poorly understood.

Purpose: The purpose of this study was to: 1) assess the efficacy of PNF in reducing muscle tone in individuals with spasticity, and 2) investigate the duration of the therapeutic effect of PNF.

Methods: Participants were five individuals with cerebral palsy that presented with spasticity at the elbow joint. The study consisted of a pretest, intervention, and posttest conducted sequentially. During the pre/posttests, a motorized manipulandum passively extended the participant’s spastic elbow from full flexion to extension at average velocities ranging from 10-160°/sec. Muscle activity was recorded from the biceps brachii of the spastic limb using surface electromyography (sEMG). The intervention consisted of five minutes of PNF applied to the elbow and shoulder joints implemented by a trained professional. sEMG activity was compared pre and posttest to detect differences in muscle activity following PNF.

Results: 1) Five minutes of PNF significantly decreased resting muscle activity and increased the range at which the spastic limb could be stretched until the onset of spasticity was detected. 2) This effect was temporary; participants returned to baseline sEMG levels after only a few trials during the post-test.

Conclusions: These findings support the notion that PNF is an effective modality to temporarily relieve the symptoms of spasticity and improve the effectiveness of therapy sessions. Due to the transient effects of PNF, however, additional research identifying the optimum stretching protocol and dosage is needed to maximize therapeutic gains.

Session F-9
Oral Presentation: Womens’ Agency and Activism
Saturday, March 9, 2013, 10:45 am
Location: Love Library 406

539 10:45 am
Voices in Contralto: Los Angeles National Organization for Women Equal Rights Amendment Activism and Failure
Lucio Quintero, Women’s Studies (U)
Anne Donadey, European Studies

This work chronicles the National Organization for Women’s (NOW) efforts to secure passage of the Equal Rights Amendment (ERA) during the 1970s. A constitutional proposal dedicated to securing gender equality for women and men, passage of the ERA was a major focus of second-wave feminism. Drawing from the Women’s History Research Center microfiche reels in SDSU’s Library archives, this work uses historical documents to illustrate Southern Californian political mobilization behind ERA efforts as well as the challenges which stymied and eventually led to ERA failure. In 1971 the ERA passed the House of Representatives and was to face the Senate, where it had previously failed. This previous failure was due in part to criticism that the ERA served the interest of women alone. This work shows how feminist activists rallied men in solidarity, earning the endorsements of Democratic Senator Alan Cranston and even Republican Governor Ronald Reagan. These efforts were successful, as the ERA passed the Senate and became eligible for ratification. However, this research demonstrates that the ERA faced more than a vote in the pursuit of ratification, as President Pro-Tem of the Senate James Mills engaged in political impropriety by withholding the ERA bill AJR 17 from the Senate floor. This research shows that only when facing a growing recall movement spurred by feminist activists did Senator Mills release the bill for a ratification vote. While the bill was successful and California became the 22nd state to ratify the ERA, the ERA would fall short of constitutional adoption by three states. This work illustrates that ERA failure was due in part to conservative legislators changing their states’ ratification rules and most injurious to the ERA, the loss of political allies. In this regard, the Republican Party, which had previously supported the ERA bill, ignored or resisted its ratification. Finally, President Ronald Reagan, who had supported the ERA as Governor, reversed his position and opposed ERA ratification. Altogether, as L.A. NOW was a major hub of feminist activism, this work offers additional insight into broader second-wave feminist activism and explanation for ERA failure on the national level.

540 11:00 am
The Effects of a Supporter’s Retelling of a Rape Victim’s Disclosure
Beth Bollinger, Communication (M)
Brian Spitzberg, Communication

Scholars have extensively studied the effect social support systems have upon a rape victim’s recovery. Evaluating the negative or positive responses given by social support systems (i.e., supporters) has primarily been the concern, while illuminating the link between these supporter reactions and a victim’s recovery has been the focus. Research validates the importance of victims retelling their rape experience to another and it has found that victims seek help from social support systems, such as friends and family, more than formal systems, like therapists or medical professionals. Conversely, it has also been found that friends or family generally, are unprepared and ill equipped to discuss and properly respond to a victim’s rape disclosure. Supporters can become burdened by their own emotions surrounding the disclosure and therefore become
hampered in their ability to avoid negative responses. The supporter who listens to a victim's rape disclosure is key to the therapeutic value that may come from victim disclosure. Research has neglected to assess the effect of what a rape retelling, by supporters, does to a victim's recovery. This proposition paper argues when a supporter retells a rape victim's story to a third party, and that action is heard by the victim, there will be a negative or positive effect on the therapeutic disclosure for the victim. It appears that research has only evaluated the communication interactions in the moment of a rape victim’s disclosure to his or her supporter and little further. By looking at the influence supporters hold over victims by their word choice used in retelling the disclosed rape experience to another, a deeper and broader understanding of what can help or limit a victim’s therapeutic disclosure process may be illuminated.

**541  11:15 am**

*Alcoholics Anonymous and Female Empowerment*

Lindsay Bond, Women's Studies (M)  
Doreen Mattingly, Women's Studies

This study analyzes whether and how Alcoholics Anonymous (AA) offers women forms of healing and empowerment. Traditional and feminist scholarship largely states that AA is hypermasculine and oppressive, providing women with no place to find healing, strength, and empowerment. A feminist critique of AA considers women in recovery to be subjugated by patriarchal influences. Although Alcoholics Anonymous and the textual language are masculinist, women are finding recovery, strength, and hope within this Twelve Step program. My driving question is how are women within AA negotiating and navigating these contradictions? According to recent studies, alcoholism and problem drinking now afflict at least 4 million American women ages 18 years and older and one third of AA's membership is now comprised of women (Sanders, 2009, 1). These statistics clearly represent the importance and need for further research into the lives of women in AA.

In the present project, I have conducted in-person interviews with an intentional sample of 10 self-identified alcoholic women who participate in the program of Alcoholics Anonymous. These women have a minimum of three years of continuous sobriety, regularly attend a women’s only meeting, and have a sponsor. The sample was selected from different neighborhoods across San Diego and from various age range, sexual orientation, and ethnic/racial groups. The interview questions are open-ended, but centered on three ways I hypothesize women in AA are recovering from addiction, finding sources of healing, and becoming empowered. The three areas I am specifically researching, through the analysis of my interviews, are: AA as a program of paradox, AA as a program of malleability, and the community of women formed within AA.

Though the results of my study are preliminary, I found significant support concerning the various ways women are challenging and reappropriating the text/discourse of AA to fit their lives, gain empowerment, and find community. Results are to be determined, presented, and discussed.

**542  11:30 am**

*Neltiz notlatol mochihuaz, 'My statement is to be carried out and done’*: Nahua Women’s Status and Agency in Eighteenth-Century Toluca Valley Testaments

Moriah Gonzalez-Meeks, History (M)  
Paula De Vos, History

“Neltiz notlatol mochihuaz, 'My statement is to be carried out and done’”: Nahua Women’s Status and Agency in Eighteenth-Century Toluca Valley Testaments

This essay analyzes the status and agency of Nahua women as evinced in eighteenth-century testaments from the Toluca Valley region of central Mexico. It examines how Nahua women utilized Spanish laws and legal institutions to their benefit, why indigenous women created testaments, which heirs were selected and what was bequeathed to them, how personal piety was reflected in Nahua women’s testaments, and whether Nahua women created and used testaments for reasons similar to those of Maya and Nudzahui (Mixtec) women. This essay draws upon social, comparative, and feminist historical methods to analyze a corpus of thirty-seven English-translation Nahua women’s testaments, in addition to secondary works analyzing eighteenth-century Maya and Nudzahui women’s testaments. This essay finds that pre-contact, gender-equitable inheritance practices, coupled with Spanish laws promoting bilateral inheritance, fostered a tradition of indigenous female ownership of property in colonial Mexico. Population increases in eighteenth-century Mexico resulted in challenges to this tradition of female ownership of property; consequently Nahua women used testaments to protect and maintain these pre-contact traditions and the autonomy and economic security that accompanied them. In addition, Nahua women used testaments to ensure the well-being of their children and relatives, in particular their daughters, and to publicly demonstrate their religious devotion and piety. Like Nahua women, Maya women used testaments to protect their daughters’ property, while Nudzahui women did not favor their daughters over their sons due to the greater gender equality found within Nudzahui society. Consequently, while Spanish colonization decreased indigenous women’s status overall, Spanish inheritance laws and testamentary practices helped protect and increase their status during the colonial period, a status which declined again, along with Spanish legal institutions, during the nineteenth century.
“Nothing is impossible to a determined woman.”
The Unexplored Louisa May Alcott
Caitlin Wion, History (M)
Edward Blum, History

Most people know Louisa May Alcott as the woman who wrote Little Women (1868). It was not until the 1970s that antiquarian-book dealer Madeline B. Stern and business partner Leona Rostenberg discovered that there was more to Alcott than Jo March and her sisters. While searching through documents in the Houghton Library at Harvard University, Stern and Rostenberg discovered a letter from an editor addressed to Alcott. This letter mentioned that the editor would be paying Alcott for the publications of stories written by A.M. Barnard. It turns out that A.M. Barnard was Alcott’s pseudonym. Using that pseudonym, Alcott wrote several salacious “blood and thunder” thrillers. Stern later published the unseen stories of Alcott’s and future biographers used these stories as a basis for understanding Alcott in a new way. However, this research focuses on understanding Alcott’s work in a historical context—which biographers have ignored.

The secondary sources used for this research included biographies from Madeleine Stern, Martha Saxton, John Matteson, and Harriet Reisen. Further, secondary sources about the historical era were used to analyze the primary sources. Primary sources were the stories that were attributed to A.M. Barnard as well as Alcott’s journals and letters.

This research indicates Alcott’s uncensored view of the nineteenth century. It also views Alcott’s thrillers and her life in a new historical context. Where she has been previously ignored, the real Louisa May Alcott will be revealed.

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543  11:45 am

**Oral Presentation:** Evolutionary Biology II
Saturday, March 9, 2013, 10:45 am
Location: Love Library 408

544  10:45 am

**Multilocus species delimitation in the Bishopella laciniosa species complex (Arachnida, Opiliones) from the southern Appalachian Mountains**
Erika Garcia, Zoology (U)
Marshal Hedin, Biology

Opiliones, commonly referred to as ‘harvestmen’ or ‘daddy longlegs,’ represent an ancient and diverse group within the class Arachnida. Despite being found in most terrestrial habitats, true species-level diversity in this fascinating group of arachnids remains poorly known. The suborder Laniatores compromises the majority of harvestmen diversity, with many species being dispersal limited and restricted to mesic microhabitats. The eastern North American laniatorean fauna remained obscure for over 60 years until a recent assessment of phalangodid diversity (Hedin & Thomas 2010). Reconstructions of the phylogenetic relationships of southeastern phalangodids are well supported for many early diverging taxa, but species limits remain unresolved. This is particularly true in the Bishopella laciniosa (Crosby & Bishop 1924) species complex, which is distributed in the heterogeneous landscape of the southern Appalachian Mountains. This group includes three described species, but results of Hedin & Thomas (2010) indicate many (> 10) divergent mitochondrial lineages, perhaps representing cryptic species. This project aims to resolve species limits within Bishopella using additional DNA sequence data. Comparative sequence data for representatives of the well-supported mitochondrial lineages was generated for the nuclear gene EF1α, and analyzed using Bayesian and Maximum Likelihood phylogenetic methods. Preliminary data is also available for UTR (untranslated) nuclear regions, developed using comparative transcriptome data. Overall, we seek to provide further evidence for high species-level diversity in a biological diversity hotspot. The identification of this cryptic diversity is necessary for understanding accurate species limits, fundamental to a broad array of disciplines, including conservation prioritization.
ABSTRACTS

545  11:00 am

Phylogenetic Inference of the Western Rattlesnake Complex Using Mitochondrial DNA

Narina Brothers, Kinesiology (U)
Tod Reeder, Biology

The Western Rattlesnake species complex (Crotalus viridis, C. cerberus, and C. oreganus) is a polytypic group with a range extending from Canada to Baja California and from the West Coast to the Midwest. Because of the variation in genes and geography, the phylogenetic relationships within the group are still uncertain. Few studies have been conducted that analyze the phylogeny and biogeography of this group. In all of these previous studies, the breadth of sampling needed improvement. In my research study, the phylogeny of the Western Rattlesnake complex was inferred using mitochondrial DNA sequence data. The mitochondrial ND2 locus was used because it is rapidly evolving and has the ability to distinguish relationships among closely related species. DNA sequence data was obtained from 62 samples, representing fine scale sampling across the range to examine the diversity exemplified by this group. DNA sequence data was collected using PCR amplification and Sanger sequencing and was analyzed within both Bayesian and maximum likelihood frameworks. A molecular clock was used to date the resulting phylogeny. The results of my study provide the most comprehensive and robust mitochondrial DNA phylogeny of the Western Rattlesnake complex to date and will shed light on questions presented by previous research about this group.

546  11:15 am

Pinniped skull-duggery: The evolution of feeding strategies in phocid seals

Sarah Kienle, Biology (M)
Annalisa Berta, Biology

During their transition from land to water, phocids (seals) evolved specific adaptations that allowed them to efficiently obtain prey in an aquatic habitat. Phocids are the most diverse pinniped (seals, sea lions, and walruses) lineage with 18 extant species and a rich fossil record. Extant phocids use multiple feeding strategies (filter, grip and tear, pierce, and suction feeding) to capture and consume prey underwater. However, no quantitative study of feeding in extant and fossil phocid taxa has been conducted to date. Therefore, the objectives of this study were to 1) determine the feeding strategies used by fossil phocids, and 2) conduct a comparative phylogenetic analysis of the evolution of feeding strategies in seals. Three-dimensional landmark data were collected from 28 fossil pinnipeds and 220 extant phocids. A total of 56 cranial and 24 mandible landmarks were collected per specimen. Principle Component Analysis (PCA) was performed to describe the major axes of variation in the dataset using the geometric morphometrics program MorphoJ. Phylogenetic analyses were conducted using a combined morphological and molecular dataset. Contrary to previous hypotheses, most fossil taxa were more closely aligned to specialist feeding types (filter and grip and tear feeding) than to generalist feeding strategies. For example, the fossil taxa Acrophoca longirostris and Leptophoca lenis occupy similar regions of morphospace as the extant predator Hydrurga leptonyx (leopard seal), which uses grip and tear feeding to capture large prey items, such as penguins, marine mammals, and fish. Knowledge of feeding strategies in phocids is fundamental to understanding the adaptations that allowed pinnipeds to reinvade the marine ecosystem.

547  11:30 am

The inference of basal snake phylogenetic relationships: The importance of combining molecular, morphological and fossil data

Sean Harrington, Evolutionary Biology (D)
Tod Reeder, Biology

Snake fossils can shed key insights on snake evolution. However, relationships among fossil and extant snakes are uncertain, and must be resolved before inferences about patterns of evolution can be drawn. Similar phylogenetic uncertainty has been historically present among many major squamate reptile clades, although recent large-scale phylogenomic analyses have helped to resolve many of these relationships. Unfortunately, fossils contain no genetic material, and cannot be included in such studies. Instead, morphology must be used to assess the relationships of fossil organisms to other taxa. The use of morphological data alone carries issues of homoplasy due to convergent evolution, and in an analysis of fossil snake phylogeny by Zaher and Scanferla (2012), the relationships among many of the extant taxa are incongruent with results of recent molecular analyses. In this study, I have combined DNA sequence data from 44 nuclear loci from Wiens et al. (2012) with morphological data from Zaher and Scanferla (2012) to best infer phylogenetic placement of eight important fossil taxa within snake phylogeny. In addition, I gathered new morphological data for the “scolecodilian” families Typhlidae, Leptotyphlidae, and Anomalepididae, rather than pooling these families together as in Zaher and Scanferla (2012), because...
molecular evidence suggests that “Scolecodiphid” is a paraphyletic group. I also collected new morphological data for five iguanian species, as molecular analyses suggest Iguania (along with Anguimorpha) are closely related to snakes. The combined data were analyzed using Bayesian phylogenetic inference. As expected due to the large amount of molecular data, relationships among extant clades exactly matched those of Wiens et al. (2012). Unlike Zaher and Scanferla (2012), but congruent with Wiens et al. (2010), my analyses reveal a sister relationship between the extinct Madtsoiidae and a clade composed of extinct, secondarily marine snakes. Dinilysia patagonica was placed outside of the crown Serpentes, as in Zaher and Scanferla (2012), but the new analyses supports a sister relationship with the extinct Najash rionegrina, which possessed robust hind limbs. The position of these extinct species as sister taxa outside of the crown Serpentes has not previously been identified, and has particularly important implications for early snake evolution.

Session F-11
Oral Presentation:
Geography: Images of Community
Saturday, March 9, 2013, 10:45 am
Location: Library Addition 63

548 10:45 am
The Language of Maps: Predictive Speech and Body Language of San Diego Zoo Visitors
Brett Moore, Anthropology (M)
Margaret Field, Native American Studies

In linguistics, a predictive speech event is an interaction in which a particular pattern of speech is commonly has been established within a culture and is expected to be followed, usually governed by place and situation. The most common example would be a coffee shop or restaurant, in which certain conversations take place in a familiar and scripted context, from greeting to order to receipt of order to departure of the customer or patron, at which point the interaction is repeat with the next person or persons.

In the study presented here, the presenter studied such interactions between groups that approached a public display map at the San Diego Zoo. Over the course of two days of study, the researchers documented a somewhat atypical type of predictive speech event, an interaction that occurred not so much between animate and responsive service providers and consumers, but rather between consumers with reference to an inanimate information source for public consumption—in this case, a map. In carefully observing and documenting approximately thirty groups of various size and composition, the researcher found a distinct pattern of conversational order among the consuming parties, with its own particular conventions for both verbal and nonverbal communication with each other and with the map itself. Furthermore, the researchers noted individual variances in these expressions, often along lines of age, gender, and group composition.

As technology continues advancing and becoming more interactive, the data gathered by the group would be useful in planning placement and utility of directories and maps to better meet the needs of the average American tourist in high pedestrian traffic areas, such as malls or theme parks. Further studies of this type and method can be conducted in other areas of the world to enrich and aid the experience of the average visitor, regardless of location or ethnicity.

549 11:00 am
The Separation Fence Between Israel, Gaza and the West Bank: An Investigation Into Israel’s Revealed and Tacit Intentions
Trevor Auser, Liberal Arts and Sciences (M)
Farid Abdel-Nour, Political Science

It is not uncommon for political actors to voice their logic behind various decisions that are of considerable consequence. On occasion though, the given reasons behind a particular political decision are only part and parcel of other more significant, more relevant, or more actual reasons influencing a particular decision. In other cases the given reasons for a particular political decision are complete and utter subterfuge, not even part or parcel of the actual reasoning behind a decision. Needless to say, deceit of this sort is done for political strategy in the effort to gain the upper hand within a conflict. The intention of this presentation is to examine the stated, official explanations Israel has given concerning the separation fence between itself and Gaza and the West Bank and to also examine what unstated, unofficial reasons Israel has for constructing this barrier. To this end it is also important to establish a firm understanding of the history of this structure and an understanding of its physical manifestation, since this particular wall in question is not just any wall but a multifaceted obstacle of varying material and defense.

Israel claims, first and foremost, that the separation wall serves as a security measure. It also claims that the wall is temporary and intended to deter suicide bombers. Overall, these positions share little resemblance with reality. Through analysis of various secondary sources one cannot help but view the separation fence as anything but a physical barrier that makes actual policies of
exclusion that have been taking place for years. It is intended to be permanent and it is intended to separate Palestinians from important water resources. Israel’s stated claims fit well within the Israeli national, defensive narrative disseminated by the regime. However, wholly giving oneself over to this understanding neglects Israel’s disguised aggression. Ultimately, rather than leading to the potential of peace between Israel and Palestine the security fence only exacerbates an already volatile and dangerous situation.

550  11:15 am

The Nostalgia of Avatar: Rectifying an American Paradox through James Cameron’s Film

Sarah Curiel, American Literature (M)
William Nericcio, English and Comparative Literature

Romantic depictions of American colonial invasion are nothing new; in fact, such depictions have been the basis for many films in the late 21st century such as Dances with Wolves (1990), Pocahontas (1995), and Avatar (2009). These narratives tend to incorporate subdued evidence of colonial violence as supplement to the core trope: a narrative in which a brave male settler befriends a beautiful native woman and forms an alliance across warring boundaries; an alliance through which the settler inevitably rescues both the woman and her native brethren from certain destruction. Many scholars have critiqued the use of such narrative tropes for erasing the violence of America’s emergence with romantic images of friendship and partnership, however little attention has been given to the key way in which such tropes present “nativeness” as something that can be learned, adopted, and thus exploited. Even less attention has been devoted to examining the way in which such an ability to adopt native identity is transferred to the viewers of these films through product marketing.

I propose that this narrative structure is increasingly popular because of its ability to make present owners of America “native;” it’s violence highly invisible because of its seemingly progressive claims to amplify the “native voice” and promote peaceful reconciliation. Building off Rosaldo’s work “Imperialist Nostalgia” and Deloria’s Playing Indian, I will look at James Cameron’s Avatar (2009) as a case study for this narrative trope. I further examine the marketing campaigns used to promote the film in order to demonstrate the way in which it’s recycled narrative first creates the illusion that nativeness can be adopted through the portrayal of a strong lead male character who learns and adopts native traits from a female native companion, and then allows the illusion to become a reality for the viewer through the marketing of consumer products reflecting the themes portrayed in the film. Thus, the violent attempts to eradicate Natives from their land are pardoned as the new owners take on the “native” identity themselves and inherent ownership of the U.S. soil, soothing the paradox at the very core of the American identity.
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