Welcome from the Chancellor

May, 2012

Dear Colleagues and Guests,

Nurturing intellectual curiosity and supporting the creation of new knowledge are at the very core of what we do as a University. The Symposium for Undergraduate Research, Scholarship, and Creative Activity at the University of California, Riverside is a celebration of the students’ scholarly work and the mentorship of our faculty. Here, we proudly showcase the diverse array of ideas and innovations emanating from our talented and intellectually curious undergraduates.

The ability to collaborate with peers and mentors, to communicate effectively and to pursue answers and solutions are invaluable skills that students participating in this symposium require. We must offer our students encouragement and the opportunity for academic exploration beyond the classroom so as to prepare them for their next steps beyond graduation from UCR. This symposium illustrates how UCR’s academic culture fosters these essential skills, and how our faculty recognize the value of hands-on learning and academic discovery.

I congratulate the student presenters and their faculty mentors for the work they have done. To our students: may this be only the beginning of your life’s exploration.

Sincerely,

Timothy P. White
Chancellor
Welcome to the Sixth Annual Symposium for Undergraduate Research, Scholarship, and Creative Activity.

The creative process can be a lonely one. The researcher toils away, sometimes in isolation, trying to shed new light that enriches our understanding of social or natural phenomena, nourishes our emotions, or enlivens our souls. However, presenting the results of that process to one’s peers and mentors is exhilarating. Here the key is clarity of communication and openness to comments and criticism. The symposium presentation is how we reveal the product of our work and improve that product through careful listening.

I commend you on your creative efforts and wish you the best as you present the results of those efforts to the larger UCR community.

With best regards,

Steven Brint
Vice Provost for Undergraduate Education
Professor of Sociology
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Symposium Objective
To increase the visibility of undergraduate research and the commitment of faculty mentors at UCR by coordinating a professional conference setting in which undergraduate students present their research projects and creative activities.
Thursday, May 3, 2012
All Sessions in the Highlander Union Building (HUB)

8:00 am – 2:30 pm  Registration for Participants
                    Third Floor HUB Lobby

9:00 am – 10:00 am  Oral Presentations
                    Session A: Room 355
                    Session B: Room 367
                    Session C: Room 379

10:00 am – 11:00 am Oral Presentations
                    Session D: Room 355
                    Session E: Room 367
                    Session F: Room 379

11:00 – 12 noon    Oral Presentations
                    Session G: Room 355

11:30 am – 1:30 pm Poster Presentations, Room 302 North

1:30 pm – 2:30 pm  Oral Presentations
                    Session H: Room 355
                    Session I: Room 367
                    Session J: Room 379

2:30 pm – 3:30 pm  Oral Presentations
                    Session K: Room 367
                    Session L: Room 379

3:30 pm – 5:00 pm  Undergraduate Research in the Community
                    Annual Spring CommuniTEA
                    Oral and Poster Presentations
                    Room 355

Friday Schedule on Page 5
Schedule of Events

Friday, May 4, 2012
All Sessions in the Highlander Union Building (HUB)

8:00 am – 1:00 pm  
Registration for Participants
Third Floor HUB Lobby

9:00 am – 10:00 am  
Oral Presentations
Session M: Room 367
Session N: Room 379

10:00 am – 11:00 am  
Oral Presentations
Session O: Room 355
Session P: Room 367
Session Q: Room 379

11:00 am – 12:00 noon  
Oral Presentations
Session R: Room 355
Session S: Room 367
Session T: Room 379

12 noon – 1:00 pm  
Poster Presentations
Third Floor HUB Lobby

1:00 pm – 2:00 pm  
Oral Presentations
Session U: Room 355
Session V: Room 367
Session W: Room 379 (Will run until 2:20pm)
Each oral presentation is allocated 15 minutes and followed by a three to five minute question and answer period. The session is moderated by a UCR faculty member or graduate student. Student participants and guests are asked to adhere to general guidelines of conference etiquette and not enter or leave the room during a presentation.

PowerPoint set-up is from 8:00am-9:00am for all sessions. If you cannot load your presentation at that time, you will have a couple of minutes between sessions.

### Oral Presentation Session A - Thursday, May 3 – HUB, Room 355, 9:00am – 10:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kevin Smith</td>
<td>Economic Consequences of the Welfare Reform of 1996: A Blessing or a Curse?</td>
<td>Steven Helfand Economics</td>
</tr>
<tr>
<td>Jennifer Brown</td>
<td>Critical Thinking Skills as Taught to 3rd and 8th Graders</td>
<td>Steven Brint Sociology</td>
</tr>
<tr>
<td>Kailani Alexander</td>
<td>The Rhetoric of Retention</td>
<td>Erica Edwards English</td>
</tr>
</tbody>
</table>

### Oral Presentation Session B - Thursday, May 3 – HUB, Room 367, 9:00am – 10:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Everardo Arias</td>
<td>Investigating Proton-Bound Nucleobase Dimers in the Gas Phase</td>
<td>Thomas Morton Chemistry</td>
</tr>
<tr>
<td>Eric Liao</td>
<td>Site Response in the Biobio Region, Chile Using the κ Method</td>
<td>Elizabeth Cochran Earth Sciences</td>
</tr>
<tr>
<td>Stephen Coffer</td>
<td>The behavior of interacting wildland flames</td>
<td>Marko Princevac Mechanical Engineering</td>
</tr>
<tr>
<td>Mitchell Shinn</td>
<td></td>
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<tr>
<td>Kurtis Watanabe</td>
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</tbody>
</table>
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### Oral Presentation Session C- Thursday, May 3 – HUB, Room 379, 9:00am – 10:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Edward Arellano</td>
<td>State Coercion</td>
<td>Dylan Rodriguez, Ethnic Studies</td>
</tr>
<tr>
<td>Jordan Rohde</td>
<td>Strait-Laced Sephardim: The Ideologies of Tzniut Modesty Practices in Sephardic Orthodox Jewish Women of Brooklyn, NY</td>
<td>Piya Chatterjee, Women's Studies</td>
</tr>
<tr>
<td>Hennessey Harrington</td>
<td>Inaugural Bioengineering Consultancy</td>
<td>Sean Jasso, Business Administration</td>
</tr>
</tbody>
</table>

### Oral Presentation Session D- Thursday, May 3, – HUB, Room 355, 10:00am – 11:00am

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<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilson Rodriguez</td>
<td>Molecular analysis of the interaction between <em>Staphylococcus aureus</em> protein Sbi and immune system protein C3d</td>
<td>Dimitrios Morikis, Bioengineering</td>
</tr>
<tr>
<td>Aaron Stamp</td>
<td>Effects of Dietary Phytoestrogens On Paternal Responsiveness And Maturation In The Biparental California Mouse</td>
<td>Wendy Saltzman, Biology</td>
</tr>
<tr>
<td>Trey Amador</td>
<td>Examination of structure and flow dynamics of an artificial blood vessel using optical coherence tomography and microfluidics</td>
<td>Hyle Park, Bioengineering</td>
</tr>
<tr>
<td>Michael Andraos</td>
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<tr>
<td>Michael Oliveira</td>
<td></td>
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<tr>
<td>Jonathan Ma</td>
<td></td>
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<tr>
<td>Christian Oh</td>
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<tr>
<td>Bioengineering</td>
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</tbody>
</table>
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### Oral Presentation Session E - Thursday, May 3 – HUB, Room 367, 10:00am – 11:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
</table>
| Yessica Garcia Hernandez | Corridos Sanguinarios: Generation AK-47 | Jonathan Ritter  
Music  
Alfredo Mirande  
Sociology, Ethnic Studies |
| Justin Miclat | The Legal Controversy on the Definition of “Obscenity.” The Contribution of a Computational Semantic Analysis | Curt Burgess  
Psychology |
| Gayat Adame | Shifting Cultural Conceptions of Self in the Lake Pátzcuaro Basin | T.S. Harvey  
Anthropology |

### Oral Presentation Session F - Thursday, May 3 – HUB, Room 379, 10:00am – 11:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
</table>
| Jimmy Vo | Capillary Electrophoresis as a Tool for Monitoring the Nature of Protein-Nanoparticle Conjugation | Wenwan Zhong  
Chemistry |
Mechanical Engineering |
| William Moore | Separation of UDP-3-O-Methyl-L-Rhamnose From a Nucleotide Diphosphate Sugar Fraction Taken From Physcomitrella patens | Eugene Nothnagel  
Botany and Plant Sciences |
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### Oral Presentation Session G - Thursday, May 3 – HUB, Room 355, 11:00am – 12:00pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew Bolten</td>
<td>The Temporal Nature of the Semantics of Cuing in the Game of</td>
<td>Curt Burgess</td>
</tr>
<tr>
<td>Justin Miclat</td>
<td>Password</td>
<td>Justin Estep</td>
</tr>
<tr>
<td>Farin Alaei</td>
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<td>Psychology</td>
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<tr>
<td>Psychology</td>
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<tr>
<td>Laila Kamali</td>
<td>Hugo Chavez: The Best Economist for Venezuela?</td>
<td>Steven Helfand</td>
</tr>
<tr>
<td>Public Policy</td>
<td></td>
<td>Economics</td>
</tr>
<tr>
<td>Amber Valles</td>
<td>Duplicities within the Urban Space reflected in Male Pathology</td>
<td>Susan Zieger</td>
</tr>
<tr>
<td>English</td>
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</tr>
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</table>

### Oral Presentation Session H - Thursday, May 3 – HUB, Room 355, 1:30pm - 2:30pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brittany Diaz</td>
<td>Parent Scaffolding Techniques on Child Comprehension: Who is Likely to Succeed?</td>
<td>Rebekah Richert</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
<td>Kate Sweeney</td>
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<tr>
<td></td>
<td></td>
<td>Psychology</td>
</tr>
<tr>
<td>Alexander Drey-Mulari</td>
<td>What do American college students do? Views from around the world</td>
<td>Karen Pyke</td>
</tr>
<tr>
<td>Sociology</td>
<td></td>
<td>Sociology</td>
</tr>
</tbody>
</table>
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### Oral Presentation Session I - Thursday, May 3 – HUB, Room 367, 1:30pm - 2:30pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Clark</td>
<td>Identification of Bacteria at the Single-Cell Level</td>
<td>Valentine Vullev, Bioengineering</td>
</tr>
<tr>
<td>Andrew Rios</td>
<td>Anti-tumor Mechanism of a Phen-based Drug</td>
<td>Jack Eichler, Chemistry</td>
</tr>
<tr>
<td>Shawnt Tosonian</td>
<td>Anti-tumor Mechanism of a Phen-based Drug</td>
<td>Jack Eichler, Chemistry</td>
</tr>
<tr>
<td>Charles Ruiz</td>
<td>Anti-tumor Mechanism of a Phen-based Drug</td>
<td>Jack Eichler, Chemistry</td>
</tr>
<tr>
<td>Elma Frias</td>
<td>Anti-tumor Mechanism of a Phen-based Drug</td>
<td>Jack Eichler, Chemistry</td>
</tr>
<tr>
<td>Ian Gilbert</td>
<td>Microfossils from Parahio Formation of the Himalaya: Resolving the Conodont Age Paradox</td>
<td>Nigel Hughes, Earth Sciences</td>
</tr>
</tbody>
</table>

### Oral Presentation Session J - Thursday, May 3 – HUB, Room 379, 1:30pm - 2:30pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Elaine Cheung</td>
<td>News Consumption and Political Awareness of Social Media’s Inadvertent Audience</td>
<td>Martin Johnson, Political Science</td>
</tr>
<tr>
<td>Chelsea Usher</td>
<td>The Creative Impact of Love and Friendship</td>
<td>George Haggerty, English, Benjamun King, Classics</td>
</tr>
<tr>
<td>Brenna Schaaf</td>
<td>Commodification in the 19th Century Arcades: Dialectical Images, Gender, and Advertising</td>
<td>Susan Zieger, English</td>
</tr>
</tbody>
</table>
Oral Presentation Sessions

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**Oral Presentation Session K - Thursday, May 3 – HUB, Room 367, 2:30pm - 3:30pm**

<table>
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<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Reginald Arevalo</td>
<td>Persepolis: The Confluence of Text and Image</td>
<td>Heidi Brevik-Zender, Comparative Literature and Foreign Languages</td>
</tr>
<tr>
<td>French, Linguistics</td>
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</tr>
<tr>
<td>Kevin Harrison</td>
<td>An Irrationally Motivational Approach to Davidsonian Weakness of Will</td>
<td>Andrews Reath, Michael Nelson, Philosophy</td>
</tr>
<tr>
<td>Philosophy</td>
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<tr>
<td>Daniel Berger</td>
<td>Border Dance in 2/4 Time – The Arts Renaissance of Juárez, Mexico</td>
<td>Juan Felipe Herrera, Michael Jayme, Creative Writing</td>
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<tr>
<td>Creative Writing</td>
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**Oral Presentation Session L - Thursday, May 3 – HUB, Room 379, 2:30pm - 3:30pm**

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<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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<tbody>
<tr>
<td>Matthew Chrisler</td>
<td>Narrative spaces of motherhood in Riverside</td>
<td>Juliet McMullin, Anthropology</td>
</tr>
<tr>
<td>Cultural Anthropology</td>
<td></td>
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</tr>
<tr>
<td>Kareen Sanchez</td>
<td>The Influence of Maternal Depression on Parent-Child Interactions and the Adjustment of Pre-School Age Children</td>
<td>Tuppert Yates, Psychology</td>
</tr>
<tr>
<td>Psychology</td>
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<tr>
<td>Stephen Ellis</td>
<td>The Eternal: A Novel</td>
<td>Andrew Winer, Creative Writing</td>
</tr>
<tr>
<td>Creative Writing, English</td>
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### Third Annual Spring CommuniTEA

**Undergraduate Research in the Community** Thurs, May 3, HUB 355, 3:30-5:00pm

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<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
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<tbody>
<tr>
<td><strong>Oral Presentation:</strong></td>
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<tr>
<td>Natalie Artinian</td>
<td>Assessing the level of adequacy and training about food allergies among faculty in local elementary schools</td>
<td>Emma Simmons UCR School of Medicine Mary Beth Fitzgerald Riverside County Office of Education</td>
</tr>
<tr>
<td>Teodor Moraliev</td>
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<tr>
<td>Eric Vu</td>
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<tr>
<td>Biology</td>
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<tr>
<th>Research Question Posters:</th>
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</thead>
<tbody>
<tr>
<td>Jessica Escareno</td>
<td>Asylum for Deaf Immigrants</td>
<td>Tanya Nieri Sociology</td>
</tr>
<tr>
<td>Public Policy</td>
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</tr>
<tr>
<td>Erin Warnock</td>
<td>Sociology, Women’s Studies</td>
<td>Eleanor Kalnin Immigration Law Offices of Hadley Bajramovic</td>
</tr>
<tr>
<td>Helen Martinez</td>
<td>Sociology, Spanish</td>
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<tr>
<td>Adriana Cruz</td>
<td>Chicano Studies, Public Policy</td>
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<tr>
<td>Elizabeth Tizcareno</td>
<td>Food Access and the Urban Garden Seminar</td>
<td>Farah Godrej Political Science Bianca Heyming Growcology</td>
</tr>
<tr>
<td>Environmental Studies</td>
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<td></td>
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</tr>
<tr>
<td>Jessica Tjiu</td>
<td>Political Effects on Sex Trafficking in Riverside</td>
<td>Amalia L. Cabezas Women’s Studies Jennifer O’Farrell Operation SafeHouse</td>
</tr>
<tr>
<td>Political Science</td>
<td></td>
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<tr>
<td>International Affairs</td>
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<tr>
<td>Asian Literature (Chinese)</td>
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<table>
<thead>
<tr>
<th>Current Project Updates:</th>
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</thead>
<tbody>
<tr>
<td>Karina Munoz</td>
<td>Olvera Street: Building Towards the Future</td>
<td>Wendy Ashmore Anthropology Valerie Garcia Olvera Street Merchant Association</td>
</tr>
<tr>
<td>Anthropology</td>
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</tr>
<tr>
<td>Pavan Rami</td>
<td>Bioremediation in the Community Garden</td>
<td>Milt McGiffen Botany and Plant Sciences Organization Members Riverside Master Gardens</td>
</tr>
<tr>
<td>Teresa Mariscal</td>
<td></td>
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</tr>
<tr>
<td>Environmental Science</td>
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</tr>
<tr>
<td>Adanna Eke</td>
<td>Conducting Focus Groups with Foster Youth and United Way</td>
<td>Scott Brooks Sociology Kevin McCarthy United Way of the Inland Valley</td>
</tr>
<tr>
<td>Psychology</td>
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</tbody>
</table>
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### Oral Presentation Session M - Friday, May 4 – HUB, Room 367, 9:00am – 10:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Ruben Bautista</td>
<td>Poverty in Haiti: An Institutional Analysis</td>
<td>Steven Helfand Economics</td>
</tr>
<tr>
<td>Brooke Bishop</td>
<td>Examining the Response of Law Enforcement and Non-Governmental Organizations to Victims of Modern Slavery: A Case Study of the Orange County Human Trafficking Task Force</td>
<td>Bronwyn Leebaw Political Science</td>
</tr>
<tr>
<td>Jessica Tjiu</td>
<td>A Literature Review on Sex Workers in China: the Exploitation of Women by the CCP</td>
<td>Amalia Cabezas Women's Studies</td>
</tr>
</tbody>
</table>

### Oral Presentation Session N - Friday, May 4 – HUB, Room 379, 9:00am – 10:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Lee</td>
<td>Families that discontinued TANF during the Great Recession: A Study of Riverside County</td>
<td>Vanesa Estrada Sociology</td>
</tr>
<tr>
<td>Brandon Walker</td>
<td>The “Quick Fix Philosophy” of Welfare Reform: Cost Concerns Versus the Importance of Education</td>
<td>Steven Helfand Economics</td>
</tr>
<tr>
<td>Jasmine Barba</td>
<td>Yo Quiero Taco Bell: A Critical look at the recreation of Mexican/Mexican American Food, Its commercialization and its ultimate colonization into American Society</td>
<td>Chikako Takeshita Women's Studies</td>
</tr>
<tr>
<td>Lauren Chavez</td>
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</table>
Oral Presentation Sessions

Each oral presentation is allocated 15 minutes and followed by a three to five minute question and answer period. The session is moderated by a UCR faculty member or graduate student. Student participants and guests are asked to adhere to general guidelines of conference etiquette and not enter or leave the room during a presentation.

PowerPoint set-up is from 8:00am-9:00am for all sessions. If you cannot load your presentation at that time, you will have a couple of minutes between sessions.

Oral Presentation Session O - Friday, May 4 – HUB, Room 355, 10:00am – 11:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miellette McFarlane</td>
<td>Poverty in Post-War Mozambique: The Role of Decentralization Policy</td>
<td>Steven Helfand Economics</td>
</tr>
<tr>
<td>Kevin Smith</td>
<td>Progressive Social Assistance in Brazil: The Evolution of Conditional Cash Transfers</td>
<td>Steven Helfand Economics</td>
</tr>
<tr>
<td>Andrea Mendiola</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christine Wong</td>
<td>Misconceptions and Realities of Poverty in Japan</td>
<td>Steven Helfand Economics</td>
</tr>
</tbody>
</table>

Oral Presentation Session P - Friday, May 4 – HUB, Room 367, 10:00am – 11:00am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Moore</td>
<td>The Testing and Improvement of Prescribed Fire Emissions Modeling for the American Southwest</td>
<td>Marko Princevac Mechanical Engineering</td>
</tr>
<tr>
<td>Sarah Beals</td>
<td>Synthesizing Epsilon-Fe2O3 Using the Reverse Micelle Process</td>
<td>Javier Garay Mechanical Engineering</td>
</tr>
</tbody>
</table>
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**Oral Presentation Session Q - Friday, May 4 – HUB, Room 379, 10:00am – 11:00am**

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jason Viray</strong> Psychology</td>
<td>Emoticons: Mean More Than :)</td>
<td>Curt Burgess Psychology</td>
</tr>
<tr>
<td><strong>Kendall Bakas</strong> English</td>
<td>Transcending Flaneurie</td>
<td>Susan Zieger English</td>
</tr>
</tbody>
</table>

**Oral Presentation Session R - Friday, May 4 – HUB, Room 355, 11:00am – 12:00pm**

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Victoria Duman</strong> Psychology</td>
<td>A multi-group, semantic trend analysis of controversial issues by applying computational techniques .</td>
<td>Curt Burgess Psychology</td>
</tr>
<tr>
<td><strong>Christopher Chen</strong> Psychology</td>
<td>A Comparison of Violence in the Bible and the Koran through Computational Analysis</td>
<td>Curt Burgess Justin Estep Psychology</td>
</tr>
<tr>
<td><strong>Matthew Bolten</strong> Psychology</td>
<td>Happy People, Trusting People, and Paranormal Belief</td>
<td>Curt Burgess Psychology</td>
</tr>
</tbody>
</table>
Each oral presentation is allocated 15 minutes and followed by a three to five minute question and answer period. The session is moderated by a UCR faculty member or graduate student. Student participants and guests are asked to adhere to general guidelines of conference etiquette and not enter or leave the room during a presentation.

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### Oral Presentation Session S - Friday, May 4 – HUB, Room 367, 11:00am – 12:00pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandra Schneider</td>
<td>The Age of Augustus and His Image in Select Contemporary Art and Literature</td>
<td>Thomas Scanlon Comparative Literature and Foreign Languages</td>
</tr>
<tr>
<td>Jose Verdin</td>
<td>Bringing Eastside Youth to UCR: Opportunity through College Exposure</td>
<td>Tanya Nieri Sociology</td>
</tr>
<tr>
<td>Yvon Guzman-Rangel</td>
<td>The Complexities of “Community Gardens”</td>
<td>Chikako Takeshita Women's Studies</td>
</tr>
<tr>
<td>Sandra Robles</td>
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<tr>
<td>Stephanie Flores-Casas</td>
<td></td>
<td></td>
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<tr>
<td>Alex Schneider</td>
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<tr>
<td>Comparative Ancient Civilizations</td>
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</tbody>
</table>

### Oral Presentation Session T - Friday, May 4 – HUB, Room 379, 11:00am – 12:00pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sung (Steve) Seo</td>
<td>Elucidating the relationship between Beta-Catenin and Prickle 1 in the Wnt/PCP Pathway upon over expression of miR-361.</td>
<td>Nicole zur Nieden Cell Biology and Neuroscience</td>
</tr>
<tr>
<td>Hayden Dahl</td>
<td>A Model Device for Active Pollution Control from Major Freeways</td>
<td>Marko Princevac Mechanical Engineering</td>
</tr>
<tr>
<td>Matt LeFort</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raul Delgadillo</td>
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<tr>
<td>Trent Nash</td>
<td></td>
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<tr>
<td>Mike Awakian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ervin Romo</td>
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</tr>
<tr>
<td>Cynthia Liles</td>
<td>One Step Fischer-Tropsch Gasoline Production from Clean Syngas: Preliminary Results</td>
<td>Joseph Norbeck Chemical and Environmental Engineering</td>
</tr>
<tr>
<td>Environmental Sciences</td>
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</tr>
</tbody>
</table>
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### Oral Presentation Session U - Friday, May 4 – HUB, Room 355, 1:00am – 2:20am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patra Sorod</strong></td>
<td>Childhood Conscientiousness, Dementia, and the Mediating Roles of Physical Activity</td>
<td><strong>Howard Friedman</strong> Psychology</td>
</tr>
<tr>
<td>Biochemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sumukh Sathnur</strong></td>
<td>Analysis of NMR Data by Visual Interpretation of Z Score Matrices (VIZR) in R</td>
<td><strong>Cynthia Larive</strong> Chemistry</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
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</tr>
<tr>
<td><strong>Darcie McClelland</strong></td>
<td>A p21 Reporter Plasmid for Assessing Beta-Catenin/FoxO3A Target Gene Expression</td>
<td><strong>Nicole zur Nieden</strong> Cell Biology and Neuroscience</td>
</tr>
<tr>
<td>Cell, Molecular and</td>
<td></td>
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<tr>
<td>Developmental Biology</td>
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<tr>
<td><strong>Helen Nguyen</strong></td>
<td></td>
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<tr>
<td>Biology</td>
<td></td>
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<tr>
<td><strong>Polina Pulyanina</strong></td>
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<tr>
<td>Biochemistry</td>
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</tr>
</tbody>
</table>

### Oral Presentation Session V - Friday, May 4 – HUB, Room 367, 1:00am – 2:20am

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>April Sanders</strong></td>
<td>Postmodern Poetry and the Stifled Woman: Female Subjectivity and Feminine Portrayal</td>
<td><strong>Steven Axelrod</strong> English</td>
</tr>
<tr>
<td>English</td>
<td></td>
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</tr>
<tr>
<td><strong>Jacqueline Balderrama</strong></td>
<td>Escaping the Habitat: A Poetry Collection</td>
<td><strong>Juan Felipe Herrera</strong> Creative Writing</td>
</tr>
<tr>
<td>Creative Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Genevie Co</strong></td>
<td>Perceived Division of Labor and Work-Family Conflict Among U.S. Married and Cohabiting Women in Heterosexual Couples</td>
<td><strong>Tanya Nieri</strong> Sociology</td>
</tr>
<tr>
<td>Sociology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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**Oral Presentation Session W - Friday, May 4 – HUB, Room 379, 1:00am – 2:20am**

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>James Tu</strong> Bioengineering</td>
<td>Biodegradable Properties of Magnesium Alloys for Ureteral Stents</td>
<td>Huinan Liu Bioengineering</td>
</tr>
<tr>
<td><strong>Eric Gutierrez</strong> Mechanical Engineering</td>
<td>Investigation of Flow through a Porous Vegetation Model</td>
<td>Marko Princevac Kambiz Vafai Mechanical Engineering</td>
</tr>
<tr>
<td><strong>Nicole Mikulski</strong> Chemistry</td>
<td>Synthesis of Syrbackin Analogs as Possible Alternative Treatments for Cancer</td>
<td>Michael Pirrung Chemistry</td>
</tr>
<tr>
<td><strong>John Baumgardner</strong> Mechanical Engineering</td>
<td>Development of Non-Rare Earth Magnetic Nano-Composite</td>
<td>Javier Garay Mechanical Engineering</td>
</tr>
</tbody>
</table>
**Poster Presentation Session**

During the poster session, all student presenters stand by their poster displays and are available to discuss their projects and answer questions.

Set-up is from 8:30am-11:00am

**Thursday, May 3  11:30 am – 1:30 pm, HUB Room 302 North**

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Presenter/Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/Dept.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNAS</td>
<td><strong>Salvador Ramirez</strong></td>
<td><strong>Abscisic Acid Signal Transduction Analysis Through Agrobacterium Biotransformation</strong></td>
<td><strong>Sean Cutler</strong> Assaf Mosguna Botany and Plant Sciences</td>
</tr>
<tr>
<td>Poster #1</td>
<td>Environmental Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNAS</td>
<td><strong>Thinn Zaw</strong></td>
<td>Analyzing for 3-O-Methyl-Rhamnosyl Residues in Targeted Knock-Out Lines of Physcomitrella patens</td>
<td><strong>Eugene Nothnagel</strong> Botany and Plant Sciences</td>
</tr>
<tr>
<td>Poster #2</td>
<td><strong>Candace Fajardo</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Biology</td>
<td></td>
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</tr>
<tr>
<td>BCOE</td>
<td><strong>Tejas Patel</strong></td>
<td>Rate of Degradation of Magnesium (Mg) Alloy Screws in Phosphate Buffered Saline (PBS)</td>
<td><strong>Huinan Liu</strong> Bioengineering</td>
</tr>
<tr>
<td>Poster #3</td>
<td>Bioengineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNAS</td>
<td><strong>Barbara Davis</strong></td>
<td>Comparison of Content and Composition in E-Juice Using HPLC</td>
<td><strong>Prue Talbot</strong> Cell Biology and Neuroscience</td>
</tr>
<tr>
<td>Poster #4</td>
<td>Biology</td>
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</tr>
<tr>
<td>BCOE</td>
<td><strong>Nidhanjali Bansal</strong></td>
<td>Determination of Protein-Protein Interaction with FRET</td>
<td><strong>Jiayu Liao</strong> Bioengineering</td>
</tr>
<tr>
<td>Poster #5</td>
<td>Bioengineering</td>
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</tr>
<tr>
<td>CHASS</td>
<td><strong>Shyamal Naik</strong></td>
<td>Educational Attainment Level Effects in LA County</td>
<td><strong>David Swanson</strong> Sociology</td>
</tr>
<tr>
<td>Poster #6</td>
<td>Sociology</td>
<td></td>
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</tr>
<tr>
<td>CNAS</td>
<td><strong>Chad Correa</strong></td>
<td>Effects of SNU's Tobacco on Rate of Movement and Percent of Motile mNSC and 3T3 Cells</td>
<td><strong>Prue Talbot</strong> Cell Biology and Neuroscience</td>
</tr>
<tr>
<td>Poster #7</td>
<td>Biology</td>
<td></td>
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<tr>
<td>CHASS</td>
<td><strong>Jazzmin Lewis</strong></td>
<td>Life During and After Collegiate Athletics</td>
<td><strong>Bronwyn Leebaw</strong> Political Science</td>
</tr>
<tr>
<td>Poster #8</td>
<td>Political Science Law and Society</td>
<td></td>
<td><strong>Scott Brooks</strong> Sociology</td>
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<tr>
<td>BCOE</td>
<td><strong>Heran Bhakta</strong></td>
<td>Design of a Novel Parallel Flow Device to Decouple Mass Transfer and Mechanotransduction at the Endothelium</td>
<td><strong>Victor Rodgers</strong> Bioengineering</td>
</tr>
<tr>
<td>Poster #9</td>
<td>Bioengineering</td>
<td></td>
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</tr>
</tbody>
</table>
During the poster session, all student presenters stand by their poster displays and are available to discuss their projects and answer questions.

Set-up is from 8:30am-11:00am

Thursday, May 3  11:30 am – 1:30 pm, HUB Room 302 North

**CNAS Poster #10**

**David Lam**  
Environmental Science  
Nitrogen Fixation of Biological Soil Crusts from the Mojave Desert  
**Robert Graham**  
Environmental Science  
**Louis Santiago**  
Botany and Plant Sciences

**CHASS Poster #11**

**Brenda Flores**  
Environmental Science  
Selective Adaptation May be Modality Specific  
**Lawrence Rosenblum**  
**Jasmine Singh**  
Environmental Science  
**James Diaz**  
**Sandy Gonzalez**  
Botany and Plant Sciences  
**Psychology**  
**Victoria Chauvel**  
**Psychology**

**CHASS Poster #12**

**Jasmine Singh**  
Psychology  
The effects of different genres of background music on women’s trait inferences about men  
**Lawrence Rosenblum**  
Psychology  
**Bowen Shaner**  
Psychology

**CHASS Poster #13**

**Joanna Wong**  
Psychology  
More Than Just A Name  
**Curt Burgess**  
Psychology  
**Lawrence Rosenblum**  
**Psychology**  
**Sandy Gonzalez**  
**Botany and Plant Sciences**  
**Victoria Chauvel**  
**Psychology**

**CHASS Poster #14**

**Jason Viray**  
Psychology  
The Temporal Nature of the Semantics of Cuing in the Game of Password  
**Curt Burgess**  
Psychology  
**Annie Chen**  
**Joanna Wong**  
Psychology

**CHASS Poster #15**

**Annie Chen**  
Psychology  
Communication and the Role of Gender in the Interpretation of Emoticons  
**Curt Burgess**  
Psychology

**BCOE Poster #16**

**Candice Sanscartier**  
Bioengineering  
Two year survey of Glassy-Winged Sharpshooter visitation and *Xylella fastidiosa* infection rates in Southern California grapevines  
**Thomas Miller**  
**Arinder Arora**  
**Genet Tulgetske**  
**Matt Daugherty**  
**Entomology**

**CHASS Poster #17**

**My Hua**  
English, Biology  
Using health-based interactomes to analyze the symptoms reported by electronic cigarette (e-cigarette) users in online forums  
**Prue Talbot**  
Cell Biology and Neuroscience

**CNAS Poster #18**

**Mina Alfi**  
Biology  
Using Time-Lapse Videos and Video Bioinformatics Tools to Study Cellular Processes in Stem Cells  
**Prue Talbot**  
**Sabrina Lin**  
Cell Biology and Neuroscience
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Set-up is from 8:30am-11:00am

**Thursday, May 3 11:30 am – 1:30 pm, HUB Room 302 North**

<table>
<thead>
<tr>
<th>CNAS</th>
<th><strong>Poster #19</strong></th>
<th><strong>Adam Marentes</strong></th>
<th>Neuroscience</th>
<th>Validation of <em>Xenopus laevis</em> Monoclonal Antibodies in White’s Treefrog, <em>Litoria caerulea</em></th>
<th>Wendy Saltzman Biology Emma Wilson Biomedical Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHASS</td>
<td><strong>Poster #20</strong></td>
<td><strong>Alexis Elston</strong></td>
<td>Sociology/Law and Society</td>
<td>Working Overtime: African American Women’s Experience of Coping with Workplace Discrimination.</td>
<td>Tanya Nieri Sociology</td>
</tr>
<tr>
<td>CNAS</td>
<td><strong>Poster #21</strong></td>
<td><strong>Tiffani Chu</strong></td>
<td>Geology</td>
<td>Photosynthesis of Contrasting Plant Growth Forms along a Chaparral to Desert Vegetation Transition</td>
<td>Louis Santiago Botany and Plant Sciences</td>
</tr>
<tr>
<td>BCOE</td>
<td><strong>Poster #22</strong></td>
<td><strong>Ryan Kozaka</strong></td>
<td>Bioengineering</td>
<td>Computationally Evaluating Effects of Osteoconductive Bulking Agents on Stress Distribution in Reconstructed Mandible</td>
<td>Victor Rodgers Bioengineering</td>
</tr>
<tr>
<td>CHASS</td>
<td><strong>Poster #23</strong></td>
<td><strong>Jemmarie Silva</strong></td>
<td>Political Science International Affairs</td>
<td>Mapping the Proliferation of Indonesian Non-Governmental Organizations (NGOs)</td>
<td>Bronwyn Leebaw Political Science</td>
</tr>
</tbody>
</table>
During the poster session, all student presenters stand by their poster displays and are available to discuss their projects and answer questions.

Set-up is from 8:30am – 12 noon

**Friday, May 4  12 noon – 1:00 pm, Third Floor HUB**

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Presenter/Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/Dept.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHASS</td>
<td>Danyelle McNeary</td>
<td>A Flaw in the Law: A study of Legislative Responses to femicide in Ciudad Juárez, Mexico</td>
<td>David Pion-Berlin Political Science Freya Schiwy Media &amp; Cultural Studies</td>
</tr>
<tr>
<td>CNAS</td>
<td>Jenny Mao</td>
<td>Characterization of Low Molecular Weight Heparin Oligosaccharide Chains</td>
<td>Cynthia Larive Chemistry</td>
</tr>
<tr>
<td>CNAS</td>
<td>Audrey Tu</td>
<td>Formation of an Intrastrand Crosslink from the UVB Irradiation of Dickerson Dodecamer DNA Containing 5-Bromo-2’-deoxycytidine</td>
<td>Yinsheng Wang Chemistry</td>
</tr>
<tr>
<td>CNAS</td>
<td>Ryan Salditos</td>
<td>Method Development for Isolation of Phosphorylated Sugars in Submergence Tolerant and Intolerant Rice</td>
<td>Cynthia Larive Chemistry</td>
</tr>
<tr>
<td>CNAS</td>
<td>Lissete Diaz</td>
<td>Physiological Regulation of Water Use of Bromus grass in Desert Chaparral Vegetation</td>
<td>Louis Santiago Botany and Plant Sciences</td>
</tr>
<tr>
<td>CHASS</td>
<td>Cortney Brown</td>
<td>Speech Alignment in Noisy Environments</td>
<td>Lawrence Rosenblum James Diaz Psychology</td>
</tr>
<tr>
<td>CNAS</td>
<td>Alina Escalera</td>
<td>The End of Analog Electronics For Positron Annihilation Lifetime Spectroscopy</td>
<td>Allen Mills David Cassidy Physics and Astronomy</td>
</tr>
<tr>
<td>CNAS</td>
<td>Tina Kim</td>
<td>Comparative Water Loss Rates of Turkestan and Oriental Cockroaches</td>
<td>Michael Rust Entomology</td>
</tr>
<tr>
<td>CNAS</td>
<td>Jaime Jordan</td>
<td>Exploring the 1993 Klamath Falls Earthquake with InSAR</td>
<td>Gareth Funning Earth Science</td>
</tr>
<tr>
<td>CHASS</td>
<td>Alanna Ocson</td>
<td>Native American Visibility and Infant Mortality</td>
<td>Chikako Takeshita Women's Studies</td>
</tr>
</tbody>
</table>
Shifting Cultural Conceptions of Self in the Lake Pátzcuaro Basin

Gayat Adame, Anthropology/History  
*Mentor: T.S. Harvey*  
Department of Anthropology

The Lake Pátzcuaro Basin, located in the north central region of the Mexican state Michoacán de Ocampo, is home to the Purépecha people and the center to what was once the *irechequa tzintzuntzani,* or Kingdom of Tzintzuntzan. Since the nineteen sixties among growing problems faced by people of the Lake Pátzcuaro basin is increasing impoverishment. Fishing, which was once the biggest source of income and part of their cultural identity, has decreased dramatically as a result of lake pollution significantly decreasing household income. Given the impoverished and seasonal nature of fishing agriculture, residents have turned to craft production and trade with tourists as an alternate source of income, something that the government has found to be a solution to the ever-increasing migration rates. For a large majority, specifically the islanders of Janitzio Island located in the center of Lake Pátzcuaro, their dependence on tourism has transformed much of their cultural markers and shifted their daily routine to focus on tourist activity. In this paper I seek to explore the construction of identity of the residents of the Lake Pátzcuaro basin and how their sense of identity has been influenced by tourist activity, government support of artisanal production as a medium to reduce the recidivism rates of migration, and the ongoing drug war.

The Rhetoric of Retention

Kailani Alexander, English  
*Mentor: Erika Edwards*  
Department of English

In “Message to the Grassroots,” Malcolm X utilized ideological content and rhetorical strategies to promote a diasporic consciousness that would position distinct points of reference, such as West African cultural retentions that remain current in the culture and intellectual traditions of African Americans. This paper provides evidence that through his content and rhetoric, Malcolm X advocated an African worldview--which challenged Western notions of the individual, of charismatic black leaders, of the value of the community, and of revolution. Regardless of the intent of his message, the speech also invites an exploration of black ontology--black existence and identity formation and what it means to be black--through the lens of the black radicalism that so profoundly influenced it. This paper also proposes that the discussion of retention should be expanded beyond the simple anthropological observation of linguistics to include the broader concept of ontology. African cultural retentions will be mapped through the lenses of ontology and rhetoric. Literature related to rhetoric, retention, charisma, ontology, and black revolutions will be cited. In addition, the writings of Malcolm X, Vorris Nunley, and Cedric Robinson will be referenced extensively. “Message to the Grassroots” advocated an African worldview critical of the prevailing Western notions of the individual and charismatic black leadership. Using several rhetorical devices, Malcolm X redirected value to the idea of community, which represented a different sense of ontology, values, and revolution--a different way of being that privileges the community over the individual. This is an African cultural retention, or Africanism.
Using Time-Lapse Videos and Video Bioinformatics Tools to Study Cellular Processes in Stem Cells

Mina Alfi, Biology
Mentors: Prue Talbot, Sabrina Lin
Department of Cell Biology and Neuroscience

The Stem Cell Core at the University of California, Riverside is a state-of-the-art facility equipped with powerful instruments for stem cell research. One of our most versatile pieces of equipment is a live-cell phase contrast/fluorescence imaging incubation unit, the Nikon BioStation CT, which can be used to develop multiplexing assays for assessing dynamic stem cell behavior. Live cellular processes are hard to observe and analyze, the BioStation CT offers a solution to that problem. Offering live cell imaging technology has added a number of valuable assays to our stem cell research. The BioStation unit consists of 30 sample slots, thus allowing high-content screening and large volume data collection. For all experiments, cells were incubated in the appropriate medium, depending on cell type, in 5% CO2 at 37°C inside the BioStation unit. In our experiments, multiple points were collected over 24-48 hours, and individual CL-Quant software procedures were developed to analyze different endpoints. CL Quant is a highly sophisticated and customizable video bioinformatics program that allows quantizing data from important cellular processes. To date, we have successfully established methods to evaluate and analyze multiple endpoints using different cell types such as human embryonic stem cells (hESC, H9), embryonic testicular carcinoma cells (NTera-2), and mouse neural stem cells (mNSC). With hESC, we were able to evaluate colony growth, proliferation/confluency, colony migration, and apoptosis from time-lapse videos using unique procedures in CL-Quant. With mNSC and NTera-2 cells, we were able to evaluate migration, proliferation/confluency and apoptosis.

Examination of structure and flow dynamics of an artificial blood vessel using optical coherence tomography and microfluidics

Michael Andraos
Michael Oliviera
Jonathon Ma
Christian Oh
Bioengineering
Mentor: Hyle Park
Department of Bioengineering
Contributors: Yan Wang, Bioengineering

The blood vascular system is the network of all the arteries and veins that circulate blood. In vitro models have fundamental in our understanding of how our system works. The purpose of this study is to examine the change in flow dynamics of an analog solution of blood plasma in the presence of blood cells. Additionally, we want to examine the resulting change in structure of a micro-channel used to mimic a blood vessel. We will use optical coherence tomography (OCT) and doppler-OCT (D-OCT) imaging to visualize fluid flow through a microfluidic device used to mimic a blood vessel. A syringe pump controls the flow rate. As a first attempt we propose to use milk as the fluid to establish a methodology of extracting flow information from images to be used in the future. Our results demonstrate our ability to extract the cross-sectional velocity profile and the resulting channel deformation. These methods can be applied to any fluid flowing through a microfluidic device. Once the methodology is established we intend to use it to analyze the flow of Bovine serum albumin (BSA), which mimics blood plasma, and blood through the microfluidic device. Knowing the extent of deformation of the micro-channel and the cross-sectional velocity profile of both de-cellularized (BSA only) and cellularized (whole blood) solutions will increase our understanding of vascular biology.
**State Coercion**

Edward Arellano, Ethnic Studies  
*Mentor:* Dylan Rodriguez  
Department of Ethnic Studies

The United States uses multiple forms of aggression and violence to secure its dominance by legitimizing multiple forms of institutionalized aggression. The state manifests its systematically structured forms of oppression to dismantle people’s social, political, and economic capacities of upward mobility. Structured forms of oppression are driven by supremacist ideologies that are violently exercised against communities of color at disproportionate rates. Aggressive policing, criminalizing, death penalties, courts, the legal system, state initiatives, fear mongering, community helplessness, inadequate housing, weak social services are but a few examples of how the state uses its authority and flexibility to create unequal conditions on targeted group of people. In particular, brown and black bodies are at the forefront of the state induced coercion. Anti-immigrant legislation reveals a growing nativist sentiment in the country against Latinos by socially marking and identifying brown bodies into an “illegal” and criminal position. The constant militarization of the U.S.-Mexico border attest to the insecurities American citizens have towards undocumented Mexican peoples. In addition, the development of prisons in the nation demonstrates the disproportionate rate of incarcerated black bodies that results from the origins of a supremacist, institution-alized, infrastructure that profiles black bodies as criminal. This paper will address the role of the state and the ways in which it violently regulates particular human bodies through the by consenting its actions through law.

**Persepolis: The Confluence of Text and Image**

Reginald Arevalo, French, Linguistics  
*Mentor:* Heidi Brevik-Zender  
Department of Comparative Literature and Foreign Languages

How is it that readers understand the content of graphic novels? Scott McCloud and Thierry Groensteen have theorized how literary techniques in comics and graphic novels allow the reader to comprehend emotions, content, and themes contained within frames of the graphic novel. These literary scholars discuss which details within the texts and images of graphic novels elucidate the text, focusing on the ways in which an author molds and shapes his or her work through word and image. According to McCloud, as minute and trivial lines, angles, shapes may seem, these visual cues combined with written texts serve as powerful tools in imparting content and theme to a reader. My goal is to examine the themes of alienation and exile in Marjane Satrapi’s memoir, Persepolis, and to focus on her methods of combining text and image to impart meaning about the experiences of exile and alienation to her readers. I will present one of four images from my thesis: a scene in which Marjane's grandmother scornfully reminds her to be true to her identity and roots. In particular I will examine the scene’s subtle, yet powerful visual elements and the ways in which Satrapi juxtaposes them against dramatic dialogue.
Investigating Proton-Bound Nucleobase Dimers in the Gas Phase

Everardo Arias, Chemistry  
*Mentor*: Thomas Morton  
Department of Chemistry  
*Contributor*: Aaron Moehlig

The discovery of telomeres containing G-quadruplexes has shown that DNA single strands can self associate via non-Watkins-Crick binding. It is known that proton-bound dimers of nucleobases play a role in pairing within nucleic acid single strands, both in DNA and in RNA. The discovery that G-quadruplexes can form within double-stranded DNA has made proton-bound dimers of C-residues more important. Once DNA is separated into single strands, the G-rich tract self-associates into G-quadruplexes while the C-rich tract forms intercalated proton-bound C dimers called the i-motif. These mechanisms may be involved in tumor growth, since strand separation into G-quadruplex and i-motif domains is seen in a variety of promoter regions of DNA. Understanding more about proton-bound dimers is of interest in developing pharmaceuticals that target these regions. Gemcitabine is a fluorinated nucleoside that acts as a nucleobase substitute and becomes incorporated into DNA of cancer cell DNA causing apoptosis. Reported here are nucleobases and nucleosides whose proton-bound dimer equilibria have been measured, as determined by varying five different relative concentrations in binary mixtures. Recently, we have identified potential nucleobase derivatives of cytosine that can give us further information of equilibrium constants for proton-bound dimerization of cytosine analogs. Reported here are various nucleo base dimers that have been examined in ESI-MS, including a protonated dihydroxybenzamidine that forms dimers with various cytosine derivatives such as 1-methylcytosine. Our current research involves determining which nucleobase our dihydroxybenzamidine product prefers including, trimethylcytosine, 1,8-naphthyridine, and 1-methyl-cytosine. The MS data shows that both 1-methylcytosine and 1,8-naphthyridine do aggregate with selective equilibrium constant in favor of the former by a factor of approximately 2.

Assessing the Level of Adequacy and Training about Food Allergies among Faculty in Local Elementary Schools

Natalie Artinian, Biology  
Teodor Moraliev, Biology  
Eric Vu, Biology  
*Mentor*: Emma Simmons, School of Medicine  
*Contributor*: Mary Beth Fitzgerald  
Riverside County Office of Education

With the intent of eradicating food allergy reaction incidences among students, we will investigate the following research questions: What is the extent of allergy response knowledge among employees at area elementary schools? How confident are employees in handling allergy incidences when they occur and how successful will an intervention be in increasing competence? The long-term goal for this research is to ensure a safe environment, through public awareness, for those afflicted with allergies. The subjects of this inquiry are the faculty and staff of local elementary schools, including teachers, principals, vice-principals, school nurses and anyone that is responsible for students. After approval from the University of California, Riverside’s Institutional Review Board, we will prepare primary surveys to assess whether faculty training on food allergies is sufficient to prevent and treat an emergency. With the assistance of Dr. Emma Simmons, The Undergraduate Research in the Community office, and the Alpha Center at UCR, we will distribute paper surveys to elementary schools in Riverside and Moreno Valley. We will establish a control group prior to analyzing the survey results. This control group will consist of randomly chosen elementary schools that will not receive an awareness program, which we will host at the test group of schools. The purpose of this program is to provide the faculty and staff with the information necessary to prevent, recognize and respond to allergic reactions. To analyze the success of the awareness program, the control and experimental subjects will receive a secondary survey and the results will be compared. Retention levels of the information provided during the awareness program will be testing again six months after the program is administered.
Transcending Flaneurie

Kendall Bakas, English
*Mentor*: Susan Zieger
Department of English

During the 1800s, in the midst of the Industrial Revolution and urban expansion, the modern city found itself subjected to the gaze of an urban spectator called the flaneur. This flaneur, first appearing in late 18th century Europe, had the innate ability to observe city life and to compose it in language and terms simple enough to be understood by a common reader. By the mid-1800s, this urban gazer had made his way across the Atlantic and found, in the growing metropolis of New York, a new urban landscape waiting to be observed and discovered. Walt Whitman, one of the first American flaneurs, took the urban landscape of New York and synthesized an amalgamated image of the city from the various boroughs, classes, and people. Furthermore, Whitman, as seen in his poetry, created a literary persona of himself that was inseparable from his representations of New York. Whitman, by doing this, showed that he was more a part of the city he observed, and the city more part of him, than the traditional understanding of the flaneur suggests; for Whitman, the city became him and he, in turn, by means of poetry, became the city.

Escaping the Habitat: A Poetry Collection

Jacqueline Balderrama, Creative Writing
*Mentor*: Juan Felipe Herrera
Department of Creative Writing

The original intention for this collection of poems was a focus on the themes of generations and humankind’s divisions due to age and perception. In exploring this idea, I read numerous poets including Simon Ortiz, Sherwin Bitsui, and Sandra Cisnaros. In addition to my study of Buddhist literature during my winter quarter, I found a more profound message in my poetry that dealt with inevitable movement, growth, and awakening. All people experience this as they age and become more aware of the world around them. As I came to understand how temporary our experience is in this world, I was also drawn to art and religious images. This pair supported my project, because art is something innately temporary yet guarded while religious figures are thought to exist outside of time. This collection has become a dialogue with people as a whole employing the metaphors of domestication and escape as vehicles for change. Rather than seeking the divisions between generations, it stresses the underlying belief that we are all on the same path to change; we are simply at different levels. Through poetry, this project seeks to demonstrate what connects us rather than what divides us.

Determination of Protein-Protein Interaction with FRET

Nidhanjali Bansal, Bioengineering
*Mentor*: Jiayu Liao
Department of Bioengineering
*Contributor*: Ling Jiang
Department of Bioengineering

Ubiquitin-like modifiers, such as SUMO, play important roles in regulating protein activities, half-life and interactions with other proteins *in vivo* and are involved in many physiological and pathological processes, such as cancers, immune response, neurodegenerative diseases and metabolic diseases. The conjugation of SUMO peptides to substrates is carried out by a multi-enzyme catalyzed cascade, involving E1, E2 and E3 ligases *in vivo*. During the activating cascade, multiple covalent and non-covalent protein-protein interactions play critical roles for a successive activation and transferring of SUMO peptides to substrates. The kinetics and protein interaction affinities in the cascade have not been determined until recently novel approaches based on quantitative FRET analysis were developed. Our group developed a novel quantitative FRET analysis methodology for quantitative analysis of FRET spectrum. FRET signal is generated when the emission spectrum of a donor overlaps with the absorption spectrum of an acceptor. This energy transfer only occurs when the distance between the donor and acceptor is between 1-10nm. Using this
technology, we will be able to determine the interaction dissociation constant ($K_d$) of the SUMO E2 ligase, Ubc9, and one the E2 heterodimer, Uba2. The $K_d$ value of Ubc9-Uba2 interaction provides a unique perspective to dissect the complex UBL conjugation cascade quantitatively.

Yo Quiero Taco Bell: A Critical look at the recreation of Mexican/Mexican American food, its commercialization and its ultimate colonization into American society.

Jasmine Barba, Sociology, Chicano Studies
Lauren Chavez, Anthropology, Women’s Studies
*Mentor: Chikako Takeshita*
Department of Women’s Studies

The American fast food industry has become one of the fastest growing corporations in the United States. Nationwide there are an array of fast food restaurants that make profit by promoting fast, warm meals that are inexpensive and appeal to the greater public. Fast food began with a simple hamburger, shake and fries, today it has expanded to include everything from cheeseburgers to tacos. Our research focuses on fast food restaurants that sell “authentic” Mexican/Mexican American food and ask whether this is a form of colonization and appropriation of culture. This question is explored by examining who is creating these restaurants, whom their target audience is, and how food corporations use this genre of food as a commercialized commodity. Our methodology includes an in-depth research of scholarly articles, selected website information, franchise history, and visual archives such as television commercials. In our research we found that Mexican/Mexican American fast food chains are not created by Mexican/Mexican Americans. Further we found that not only is Mexican food commercialized but it is anglicized to attract greater populations. These franchises deviate from traditional ingredients and create their own interpretations of Mexican food. After this is done corporations sell the revised and reinterpreted food into the communities from which they lifted the original recipe. The creation of an affordable menu, culturally relevant spokesmen and building fast food restaurants at disproportionate rates in neighborhoods of color all contribute to the colonization of Mexican/Mexican America food. American society colonizes food and culture in similar ways, by first denying and eliminating their authentic form and then taking them to create "ethnicity" and "ethnic" that are more amenable to the greater society. After commercialism and appropriation of culture, what we are left with is food that we no longer can trace its roots, but is only relevant for the money it brings.

Development of Non-Rare Earth Magnetic Nano-Composite

John Baumgardner, Mechanical Engineering
*Mentor: Javier Garay*
Department of Mechanical Engineering

The Department of Energy (DOE) has identified rare earth materials as ‘critical materials,’ therefore the replacement of these materials would be beneficial. One major use of rare earth materials is in permanent magnets, due to their strong magnetic properties. This study is working toward creating a non-rare earth permanent magnet that would have magnetic properties that compete with current rare earth permanent magnets. Creating a composite of a hard and soft magnet can result in stronger properties than either magnet has alone through magnetic exchange coupling. A core shell structured composite can be used because it provides a high amount of interface area to facilitate magnetic coupling. This structure is made by precipitating the shell particles on the surface of the desired core particles. Before the final structure can be made the core and shell particles should be optimized individually. For the core, purchased powder is broken down in a low energy ball mill to obtain useable particles. For the shell, particles are obtained through a precipitation reaction, which is then washed and dried. Precipitation of the shell particles has shown mixed results due to the presence of byproducts in the final powder. Once the shell particles are made free of byproducts the core particles will be added before precipitation occurs, giving the desired core shell structure.
Poverty in Haiti: An Institutional Analysis
Ruben Bautista
Political Science/International Affairs
Mentor: Steven Helfand
Department of Economics

The extreme amount of poverty in Haiti has been a persistent issue throughout the history of the nation. In aspects such as income, health, education, and housing the people of Haiti have one of the lowest standards of living in the world. This paper analyzes poverty in Haiti through the lens of the country’s institutions. The research methodology is based on Nobel Prize winner Douglas North’s approach to economic history in determining how institutions emerge and evolve in a given nation. The paper conducts an economic historical analysis of Haiti to identify how key institutions were established in colonial times, how they evolved through independence to modern times, and their effects on poverty. Colonial institutions, and international factors, played a critical role in shaping the modern political institutions that influenced the social and economic outcomes that have plagued the country. In this context, I examine quantitative data on regional differences in poverty and inequality, and social implications such as migration, and draw connections with their institutional causes. The paper then focuses on how the international community has attempted to combat poverty and assist the Haitian government in strengthening its institutional capacity to implement successful anti-poverty measures, especially after the 2010 earthquake. The paper concludes that the Haitian government—with the support of the international community—must construct improved institutions in order to provide infrastructure, more equitable regional development, education, and health services that are essential for alleviating poverty in Haiti.

Synthesizing ε-Fe2O3 Using the Reverse Micelle Process
Sarah Beals, Mechanical Engineering
Mentor: Javier Garay
Department of Mechanical Engineering

Nanosized iron oxides have attracted significant attention within the scientific community for their numerous applications, such as information storage and permanent magnets. One such iron oxide is the ε polymorph of Fe2O3. This iron oxide is a rare phase only existing as nanosized particles. The polymorph is an intermediate phase between the more thermodynamically stable Y-Fe2O3 and α-Fe2O3 phases; therefore it can only be observed at specific temperatures and is difficult to synthesize as a single phase. Despite the complications, this material is worth pursuing because it has exhibited promising characteristics, primarily its giant coercivity. In order to achieve a pure single phase, ε-Fe2O3 must be carefully synthesized. Previous studies have used such synthesizing techniques as thermal composition and oxidation, which is the heat treatment of Fe-bearing precursors. Chemical synthesis techniques have also been utilized, mainly the reverse micelle and sol-gel processes. The primary focus of this research is to successfully synthesize ε-Fe2O3 using the previously mentioned method. Although the ε-Fe2O3 polymorph has yet to be successfully created, intermediate steps within the process have been successfully completed. The results show that the goal is achievable. Once the method can be completely replicated successfully, and the characteristics confirmed with X-Ray Diffraction (XRD), then investigation can begin on the effect of synthesizing conditions on the properties of ε-Fe2O3; such as grain size, phase purity and stability.
Border Dance in 2/4 Time- The Arts Renaissance of Juárez, Mexico

Daniel Berger, Creative Writing  
*Mentors:* Juan Felipe Herrera, Michael Jayme  
Department of Creative Writing

During the 1930s and ’40s, Ciudad Juarez, located in the state of Chihuahua, Mexico, experienced an arts renaissance similar to that of Harlem, New York. This subject has not been explored sufficiently and I have been engaged in research to obtain details on El Paso and Juarez, such as the Mexican Revolution, the history of the tango dance, and theaters in El Paso. Additionally, I have researched the tango roots of Buenos Aires, along with Jewish vaudeville and theater in New York. Cuca and Eva Aguirre, traveling Tango dancers and singers whom Professor Herrera has had the opportunity to interview, is the focus of this creative project. The other areas researched provide both context and contrast. The poems and prose included in the creative project converse with one another and paint a picture of what it was like to have lived during this period, and in different people’s shoes.

Design of a Novel Parallel Flow Device to Decouple Mass Transfer and Mechanotransduction at the Endothelium

Heran C Bhakta, Bioengineering  
*Mentor:* Victor G. J. Rodgers  
Department of Bioengineering  
*Contributors:* Ryan Kozaka, Chris Hale, Prashanthi Vandrangi  
Department of Bioengineering

The vascular endothelium triggers various signaling pathways to maintain its homeostasis. The regulation of these signaling pathways has been attributed to mechanical transducers (which convert mechanical forces to chemical signaling pathways) in contrast to chemical transfer. In our research, we will test the role of endothelial mass transfer independent of mechanotransduction. To investigate this, we designed *in-vitro* experiments utilizing a modified parallel flow device to decouple mass transfer and mechanotransduction. A constant shear stress will be applied while modifying the concentration gradient across the membrane by varying the transmembrane pressure. We designed a parallel flow device (8 cm x 2.5 cm) using polymethyl methacrylate (PMMA). The device encompasses bottom and top chambers. The bottom chamber has two slits for inlet and outlet. A cell seeded membrane separated both the chambers. The membranes used are polycarbonate membranes with 5.0 μm pore size (Whatman (New Jersey)). The top chamber contains an additional inlet to facilitate the transmembrane pressure. To test the optimal working of our device, simulates were run using COMSOL Multiphysics (Version 3.5) to analyze the mass transfer of Ca²⁺ from the culture media into the endothelial bed. The fluid phase (μ=0.0098 g/(cm-s)) was governed by the continuity equation and the incompressible Navier-Stokes equation. The chemical species (D=3.2 x 10⁻⁵ cm²/s) flowing through the system follows the equation of conservation of mass flowing through an incompressible medium and Fick's Law of diffusion. Our preliminary computational results show substantial change in concentration gradients for constant shear profiles. We will further test the designed flow device to delineate mass transfer from mechanotransduction by seeding endothelial cells on the membranes and studying the impact of varying transmembrane pressures on them.

Examining the Response of Law Enforcement and Non-Governmental Organizations to Victims of Modern Slavery: A Case Study of the Orange County Human Trafficking Task Force

Brooke Bishop, International Affairs  
*Mentor:* Bronwyn Leebaw  
Department of Political Science

This thesis examines the role of non-governmental organizations and law enforcement in combatting human trafficking in the United States with particular emphasis on the Orange County Human Trafficking Task Force (OCHTTF). An in-depth descriptive case study
A Comparison of Violence in the Bible and the Koran through Computational Analysis

Matthew Bolten, Psychology  
*Mentors: Curt Burgess, Justin Estep*  
Department of Psychology

Computational models can be used to handle a variety of both methodological and research issues including allowing a comparison of word usage across populations or different texts. One computational model of semantics (HAL) that can learn word meaning and can compute a measure of similarity between words was used to compare the Bible and Koran with respect to the nature of violence represented in each text, treating the Old and New Testaments of the Bible separately. Words that occurred in all three texts were organized into categories (e.g. violent, good, sin). A sample from three of the categories that had sufficient frequency in all three texts was included in the analysis. Each word included in the analyses was context checked, each the sentences that contained an instance of a word in the analysis was read to determine if the word was used in an appropriate context relative to the category of the word (e.g. killing time is not violent and would become killing time). Results indicate that the model was able to provide useful information about violence in the three texts. Additionally, the differences in usage and representations of violence found were between the Old Testament and the other texts, the Koran and New Testament being similar in most respects.

The Temporal Nature of the Semantics of Cuing in the Game of Password

Matthew Bolten, Psychology  
Justin Miclat, Psychology  
Farin Alaei, Psychology  
*Mentors: Curt Burgess, Justin Estep*  
Department of Psychology

The HAL (Hyperspace Analog to Language) memory model has previously been used to understand semantic and associative priming, grammatical categorization and various other memory and language phenomena. In the current study, the HAL model was used to investigate effects in a dynamic language exchange. Participants completed a game of Password in which one participant is given a target word and must give cues to help the other participant guess the target word. Distances computed using the HAL model were used to determine how the contextual similarity of the cues to the target word, guesses to the target word, and guesses to the cues changed over time. The goal of the study was to gain information about how dynamic language exchanges emerge over time, how people might steer each other to a particular concept, as well as how a contextual similarity model can help us learn about these phenomena and the extent to which it can predict human behavior.

Speech Alignment in Noisy Environments

Cortney Brown, Psychology  
*Mentor: Lawrence D. Rosenblum*  
*Contributor: James W. Dias*  
Department of Psychology

Humans have the tendency to unconsciously adopt the characteristics of their conversational partner’s speech, such as speech rate, and vocal intensity (e.g. Goldinger, 1998). This phenomenon is referred to as speech alignment. Previous research indicates that participants align to one another with (Dias & Rosenblum, 2011) or without (Pardo, 2006) visual cues from their conversational partner. The current study explored how background (talker babble) noise would affect speech alignment between...
interlocutors of an interactive task. Word tokens were extracted from recordings of the interlocutors taken before and after they interacted. Alignment was assessed by naïve raters, who were instructed to compare the similarity of these pre- and post-interaction tokens in a matching task. The results indicate that though speech alignment was observed between interlocutors when there was no background noise present, alignment did not occur when the interaction occurred in the presence of background noise. One possible reason for this could be a phenomenon known as ‘clear speech’ (e.g. Uchanski, 2005) in which interlocutors will adjust the acoustical characteristics of their speech in an attempt to be better understood in a noisy environment. It is also possible that the background noise acted as an environmental distractor, making it more difficult for the interlocutors to extract the speaking style from their partner’s speech, thereby preventing alignment.

Critical Thinking Skills as Taught to 3rd and 8th Graders

Jennifer Brown, Sociology
*Mentor: Steven Brint*
Department of Sociology

Are critical thinking skills being effectively taught in the 3rd and 8th grade levels of California’s public education system? I propose that the development of critical thinking skills is related to reading and writing instruction and that the use of technology has impacted these processes for both students and instructors. In this paper, I analyze existing literature to provide definitions of critical thinking, the link between critical thinking and reading and writing skills, and the state requirements for 3rd and 8th grade reading and writing instructors. I also analyze online survey responses from instructors and personal observation data gathered from classroom visits. The results will show that increased focus on standardized testing has demanded a memorization style of learning from both teachers and students and that increased class sizes have reduced instructor’s abilities to interact directly with students leading to a dependence on tests for evaluation of student’s skills. As a result of this dependence, completing essays displaying complex reasoning skills have become an anomaly instead of the norm. I will also show how new technology is changing how students craft writing assignments, reducing the amount and quality to bite sized pieces conforming to the texting guidelines they have become accustomed to. The results confirm that a combination of factors has directly impacted the teaching and learning process of critical thinking skills for students and instructors.

The Temporal Nature of the Semantics of Cuing in the Game of Password

Jason Viray
Annie Chen
Joanna Wong
Psychology
*Mentors: Curt Burgess, Justin Estep*
Department of Psychology

The HAL (Hyperspace Analog to Language) memory model has previously been used to understand semantic and associative priming, grammatical categorization and various other memory and language phenomena. In the current study, the HAL model was used to investigate effects in a dynamic language exchange. Participants completed a game of Password in which one participant is given a target word and must give cues to help the other participant guess the target word. Distances computed using the HAL model were used to determine how the contextual similarity of the cues to the target word, guesses to the target word, and guesses to the cues changed over time. The goal of the study was to gain information about how dynamic language exchanges emerge over time, how people might steer each other to a particular concept, as well as how a contextual similarity model can help us learn about these phenomena and the extent to which it can predict human behavior.
Communication and the Role of Gender in the Interpretation of Emoticons

Annie Chen, Psychology
Mentor: Curt Burgess
Department of Psychology

In an era that is capitalized by technological advances, interpersonal interactions have diminished due to the inherent nature of digital communication mediums. One relatively recent development was the evolution of the use of emoticons (symbols used to express emotion among Internet users). The communication research has shown clear distinctions between genders in emotional expression. Wolf’s (2000) work on emoticon usage in a business setting also showed gender effects, however, due to the very small number of emoticon usages her research was replicated in this study. This study utilized a much larger language sample collected through Live Journal entries within the Asian communities. The present study aimed to see whether there is a relationship between gender and emoticon expressions and if Wolf’s findings would be replicated. It was also hypothesized that male use of emoticons are predominately in ways of expressing teasing or sarcasm, while female writers express a wider variation in emoticon usage. The results show a partial replication of Wolf’s results, but also demonstrate the needs for adequate language samples and how that results in a finer granularity of inferences that can be made.

News Consumption and Political Knowledge of Social Media’s Inadvertent Audience

Elaine Cheung, International Relations
Mentor: Martin Johnson
Department of Political Science

In recent years, mainstream television news viewership has declined dramatically and major newspaper publications are seeing significantly lower circulation numbers every year. More people in the United States turn towards Internet news sources to keep up to date with political development within the country. This method of political exposure requires the personal interest of the individual to actively seek out political information. Therefore, political disengaged individuals could easily become unaware of political developments. The emergence of social media can potentially fill this information void through the interaction on social media platforms between politically disengaged individuals and politically engaged individuals. This study seeks to provide insight into the relationship of college students’ social media usage and politics. It is important to understand the patterns of news consumption amongst this technologically inclined generation because as this generation becomes the age most likely to be politically active there will be a shift in how political information is consumed. I interviewed two groups of students, politically engaged and politically disengaged, to see if there are any trends in their consumption behavior. I want to find if shared political news and activity filters into the newsfeed politically disengaged students’ allowing them to be inadvertently exposed to political information by their casual use of social media.

Narrative Spaces of Motherhood in Riverside
Matthew Chrisler, Cultural Anthropology
Mentor: Juliet McMullin
Department of Anthropology

Increasing local and national attention to unintentional injury has given rise to greater concern over parental practices of child supervision. Under-examined in this context are interactions among mothers and their children on the one hand, and the domestic spaces they interact in, on the other. This paper examines qualitative interviews from low-income mothers in Riverside, California to explore how mothers’ attitudes of child-rearing are reflected in their narratives of homes and yards. Mothers’ stories of child-rearing demonstrate the intersections of individual practices and the structure of spaces, which continuously construct environments that are significant facilitators of child rearing decisions.
Photosynthesis of Contrasting Plant Growth Forms along a Chaparral to Desert Vegetation Transition

Tiffani Chu, Geology  
*Mentor:* Louis Santiago  
Department of Botany & Plant Sciences

Photosynthetic rates of desert growth forms in transitional ecosystems, such as the gradient from chaparral to desert, are not well known. Morongo Valley is an ecosystem that is a transitional zone between a Mediterranean-type chaparral shrub land and a desert, resulting in a high number of species that can be supported. In this experiment, we investigated the photosynthetic rates of three commonly found growth forms. 19 species were organized by growth forms: (1) Trees, (2) Shrubs, and (3) Succulent. With a particular emphasis on how succulent plants compared to shrubs and trees, maximum electron transport rate (ETR), photosynthetic quantum yield at the highest light level, and point of light saturation were measured in Winter of 2012. We used these parameters to characterize photosynthetic behavior of these three growth forms found at Morongo Valley. Maximum ETR is useful as a tool to determine the rate of which a species can supply energy for photosynthesis. Measurements taken using chlorophyll fluorescence showed that succulent growth forms had significantly higher mean values of both yield and ETR. Compared to tree and succulent growth forms, the measured mean light saturation for shrubs were found to be the highest. The tree growth form showed significantly lower measurements of yield and ETR. These results indicate that succulent growth forms have a higher value for two out of the three parameters, consistent with growth in high light, desert ecosystems.

Identification of Bacteria at the Single-Cell Level

John Clark, Bioengineering  
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Department of Bioengineering

Contributors: Jasper Huang, Jonathan Avesar, Pirran Tukina, Vicente Nuñez  
Department of Bioengineering

More than a quarter of human deaths worldwide are caused by infectious diseases many of which result from bacterial infections. Current methods for identification of bacteria can take up to 72 hours. In the meantime, patients are often treated with broad-spectrum antibiotics, which not only may have neutral effects on the patients’ condition, but also can lead to the build-up of antibiotic resistant strains. As previously shown by our group, dynamic staining provides venues for rapid bacterial identification. In this project we investigated the use of the dynamic staining approach for identification of bacteria at the single-cell level. We obtained sequential images (i.e., fluorescence-microscopy movie) of E. coli and B. subtilis cells during uptake of an amyloid stain, a fluorescence dye thioflavin T (ThT). The excellent signal-to-noise ratios of the dynamic images allowed us to extract the kinetics of staining. Furthermore, we observed that ThT stains bacterial endospores even in the presence of environmental contaminants such as, blood serum, DNA, and humic acid. Combining fluorescence microscopy and the kinetic observations, allowed us to bring dynamic staining to a single-cell level.

Perceived Division of Labor and Work-Family Conflict among U.S. Married and Cohabiting Women in Heterosexual Couples

Genevie Co, Sociology  
*Mentor:* Tanya Nieri  
Department of Sociology

This study aimed to determine 1) whether married women differed from cohabiting women in levels of perceived fairness of the division of household and paid labor, and 2) whether married women differed from cohabiting women
in the amount of conflict between family life and paid work. The nationally representative U.S. sample is composed of heterosexual married and cohabiting women between the ages of 18 to 64. 73% of married women and 66% of cohabiting women reported a fair division of labor. 37% of married women and 24% of cohabiting women reported no work-family conflict. Logistic regression analyses showed that, controlling for other individual and couple characteristics, there were no statistically significant differences between married women and cohabiting women in the likelihood of either perceiving an unfair division of labor or reporting conflict between family life and paid work. Income, the number of minor children in the household, current employment, highest level of education completed, and number of time married were associated with the likelihood of reporting conflict. However, none of the covariates in the model predicting the likelihood of perceiving an unfair division of labor were statistically significant.

The behavior of interacting wildland flames

Stephen Coffer
Mitchell Shinn
Kurtis Watanabe
Mechanical Engineering
Mentor: Marko Princevac
Department of Mechanical Engineering

Prescribed burning, the controlled application of fire to wildland areas, is a tactic used to achieve ecological objectives and reduce the risk of severe wildfire. The prediction and control of fire behavior during these burns is critical. Prescribed burns typically involve the ignition of multiple fires to achieve the desired objectives. The merging of these individual fires is of major concern, as flame height and rate of spread are observed to increase markedly during their coalescence. The behavior of interacting fires was investigated at the USDA Forest Service Pacific Southwest Research Station in Riverside, California. Pine needle fuel beds (*pinus palustris*) were constructed in various configurations to investigate the behavior of adjacent flames. Fire properties measured include rate of spread, flame length, flame angle, (high-definition video), fuel bed temperature field (infrared imagery/thermocouples), fuel bed heat flux, and fuel consumption rate. The results of these experiments showed that flame geometry, rate of spread, and fuel consumption rate are intimately related during the merging process. As the flame fronts approach each other, fuel consumption rate and fuel bed heat flux increase significantly due to an increase in both radiant and convective heat transfer.

Effects of SNU Tobacco on Rate of Movement and Percent of Motile mNSC and 3T3 Cells

Chad Correa, Biology
Mentor: Prue Talbot
Contributors: Victor Slupski, Jonathan Balakumar
Department of Cell Biology and Neuroscience

SNUs, small pouches of cut tobacco placed under the lip as an alternative to smoking, are manufactured and stored in a manner that causes them to deliver lower concentrations of some harmful chemicals than other tobacco products (Foulds, Tobacco Control 2003;12:349–359). The purpose of this study was to quantify the effects of SNUs tobacco on the percent of motility of cells and the rate of cell movement (pixels/hour) in dose response experiments. It was hypothesized that SNUs tobacco would inhibit both percent motility and rate of cell movement. Mouse 3T3 fibroblasts and mouse neural stem cells (mNSC) were individually incubated for 24 hours at 37°C in a Nikon BioStation CT live cell imaging workstation. Varying concentrations (0.1%, 0.3% 1.0%, 3.0%, 10%) of SNUs tobacco extract were tested. Negative control wells had culture medium without SNUs extract. Four brands of SNUs tobacco were used: SNUs Frost, SNUs Mellow, Skoal Bandit, and Copenhagen. Images of multiple fields were taken every hour and each experiment was repeated twice with each cell type. The time-lapse videos were then analyzed using segmentation and tracking recipes (which measured displacement) developed with CL-Quant software. The results showed that SNUs tobacco inhibited the rate of
cell movement and the percentage of motile cells for each cell type. Copenhagen had more detrimental effects, followed by SNU's Mellow, Skoal Bandit, and finally SNU's Frost. 3T3 cells displayed greater sensitivity than mNSC as the concentration of SNU's extract increased. These data show that at non-cytotoxic doses SNU's extracts can impair motility of various cell types and add to our previous data on SNU's effects on survival.

**Happy People, Trusting People, and Paranormal Belief**

Casey Crowell, Psychology  
*Mentor: Curt Burgess*  
Department of Psychology

Paranormal belief is a common phenomenon that has an effect on a broad range of people in society whether it is through religious practice, superstition or precognitive experience. The present study attempts to determine the nature of the interaction between general trust and extraversion and their effect on paranormal belief. This experiment examined 101 subjects’ scores on measures of general trust and extraversion and was analyzed by a two-by-two factorial analysis of variance. Participants were administered three questionnaires: the Big Five Inventory, the Skepticism, Gullibility and Trust Scale and the Paranormal Belief Scale. Marginally reliable results were found for the main effects of extraversion and general trust on paranormal belief. There was also a marginally reliable interaction between the three variables. Individuals who were trusting scored similarly on paranormal belief whether they were extraverted or not. However, individuals who were not trusting scored higher on paranormal belief when they were extraverted than when they were not. Understanding the role of trust in the belief in paranormal or supernatural is important since many studies have shown that religious practices can create trust within groups through shared belief in societal values. Therefore understanding the personality traits behind what causes a person to believe, or not believe, in the paranormal is the first step in understanding a group that may be different from one’s own.

**A Model Device for Active Pollution Control from Major Freeways**

Hayden Dahl  
Matt LeFort  
Raul Delgadillo  
Trent Nash  
Mike Awakian  
Ervin Romo  
Mechanical Engineering  
*Mentor: Marko Princevac*  
Department of Mechanical Engineering

It is well known that automobile emissions contribute a significant amount of pollutants into the air. The use of freeways has allowed for a larger flow rate of automobiles along one path, making freeways areas with the largest particulate emission density. One of the largest issues associated with internal combustion engine pollution is the dangers it poses to human health when the pollutants are allowed to settle near ground level. Tall walls were introduced on freeways in order to block sound pollution along residential areas a.k.a. sound barriers. But little is known how these sound barriers affect the dispersion of pollutants from highways. A comprehensive study is conducted at UCR’s laboratory for Environmental Flow Modeling that demonstrated how sound barriers lift pollutants to the higher levels preventing them of settling near ground level in residential areas. An alternative idea to aid pollution dispersion is also investigated. The idea is to actively “pump” pollutants from the freeway to higher altitude. This is to be achieved with large fans that are placed on the sound barriers. To test the feasibility of a large scale deployment of such active device we constructed a laboratory scale model. In this presentation we will 1) demonstrate the concept, 2) explain major design components, 3) discuss manufacturing limitations, and 4) present the results of the model testing.
Comparison of Content and Composition in E-Juice Using HPLC

Barbara Davis
Biology
Mentor: Prue Talbot
Contributor: Sabrina Lin
Department of Cell Biology and Neuroscience

A high performance liquid chromatographic (HPLC) method was developed for the identification and quantification of various chemicals found in electronic cigarette refill solutions, also known as e-juice. HPLC analysis was run using a Hewlett Packard Series 1100 HPLC instrument with a Thermo Scientific Hypersil ODS C18, 200mm x 4.6mm, 5 μm column. The flow rate was 0.8 mL/min with an injection volume of 5 μL. An isocratic method was used with a mobile phase that consisted of 76.9% water, 23% acetonitrile, and 0.1% triethylamine and a pH of 7.6. E-juice samples were purchased in duplicate at different times to test for quality control and consistency in manufacturing, and the chromatographic data as well as 3D spectra were evaluated and compared. Duplicate samples were also visually compared for color variations. This analysis revealed that there are significant variations in content and composition of e-juice solutions as well as inconsistencies in manufacturing and labeling between and within brands of e-juice. Those disparities are present not only among different brands of e-juice but also within the same flavor of products from the same manufacturer. These data show that users of these products may be exposed to different chemicals and nicotine concentrations in different bottles of the same product and further raise concerns about quality control in e-juice production.

Parent Scaffolding Techniques on Child Comprehension: Who is likely to Succeed

Brittany Diaz
Psychology
Mentors: Rebekah Richert, Kate Sweeney
Department of Psychology

Dialogic book reading can help children to advance in literacy; however, there are many different approaches that parents take while book-reading. Past studies have shown the different ways in which parents encourage their children to participate in reading, but there has not been a consensus as to which approach correlates the greatest benefit. The present study aims to find the relationship between three popular scaffolding approaches and child comprehension. We coded for “wh-” questions, yes or no question, and statements during parent-child book reading and correlated the tallied amounts with their children’s post test scores. Furthermore, we examined attention levels and whether the questions or statements were central or peripheral to the book’s narrative. The purpose of this study is to determine which strategies will help children to better understand narratives during book reading.

Physiological Regulation of Water Use of Bromus grass in Desert Chaparral Vegetation

Lissete Diaz, Biology
Mentor: Louis Santiago
Department of Botany and Plant Sciences

Grasses of the genus Bromus are commonly found throughout California and desert, yet little is known of their water consumption. We analyzed Bromus grasses under deciduous vs. evergreen shrubs to compare the amount of water consumption of the grasses under different shrub conditions. We also measures predawn and midday leaf water potential and stomatal conductance of water vapor from leaves once every other hour to characterize hydraulic behavior and to calculate diurnal water. The study was conducted near Morongo Valley, California. We compared the grasses found under Juniper with grasses under Ziziphus form...
mid-January through April. Stomatal conductance values were plotted, demonstrating that grasses found under the deciduous shrub (Ziziphus) transpired more than that under the evergreen (Juniper). The difference in predawn and midday water potentials was evident for both treatments having a more negative potential during the midday readings. The grasses under Ziziphus were more likely to have more positive water potentials than those under Juniper. Thus, water use of Bromus is dependent under what shrub it is found.

**What do American college students do? Views from around the world.**

Alexander Drey-Mulari
Sociology
*Mentor:* Karen Pyke
Department of Sociology

This study examines the way foreigners view U.S. college students and the U.S. system of higher education. Based on interview data from 24 internet chat room partners from Asia (the East) and Europe and Canada (the West), I find many foreigners hold negative views of U.S. college students, the American higher education system, and American culture in general. Respondents attribute their views largely to media depictions of U.S. society. This study also shows data that support the idea of respectable education in America. I contrast the data with recent studies of the higher education system. Based on those studies the perceptions that I found can be considered fairly accurate. My research takes the idea of what it means to be an American college student, and questions what that really means.

**A multi-group, semantic trend analysis of controversial issues by applying computational techniques**

Victoria Dumon, Psychology
Christopher Chen, Psychology
*Mentor:* Curt Burgess
Department of Psychology

This study explores the meaning shift of the terms, repressed memory and recovered memory, by applying the Hyperspace Analogue to Language (HAL) model of memory. Such an analysis of contextual changes of words through a set amount of time may lead to a better understanding of how history can change the perception of controversial terms. The HAL model uses an inductive learning algorithm to encode contextual usage of word relationships. The model learned from the corpus of newsletters published over a twenty year span by two antithetical groups involved in the debate on repressed/recovered memory. Word meaning is represented in a 6,000 dimensional state space. The dependent variable of this study is the connotation of terms related to recovered and repressed memory. History (the first and last 5 years of published newsletters) is the independent variable. The results illustrated the changes in semantic neighborhoods of words related to the scientific and legal status of the concepts of recovered and repressed memory. An additional finding was an increase in the use of the language generally used to describe pseudosciences. This trend analysis showed that HAL was able to capture the nuanced meaning shift in discussions about very controversial topics.
The Eternal: A Novel

Stephen Ellis, Creative Writing & English
*Mentor: Andrew Winer
Department of Creative Writing

Heading home from work, Maurizio De Totero, a translator and Roman native, shares a brief encounter with a woman who ultimately throws herself in front of the subway train that the two were waiting to board. Fraught with aimless grief at this strange occurrence, Maurizio struggles to find some understanding in the event. He begins to turn the lens of examination towards himself, and he discovers the numerous parallels that the woman’s life and his own share: he ultimately vows to attend mass at a different Catholic Church in Rome every weekend for one year. But whether or not he can fulfill this promise, ostensibly made from some misplaced notion of duty to the woman, remains to be seen.

Working Overtime: African American Women and Racial Discrimination in the Workplace

Alexis Elston, Sociology/Law and Society
*Mentor: Tanya Nieri
Department: Sociology

While several studies in recent years have discussed racial discrimination of African Americans within the workplace, there is a lack of research that focuses on gender as well as race, especially in regards to African American women. This study examines the extent to which African American women experience regular discrimination in the workplace and the mechanisms that they employ to cope with that discrimination. This study is a primary analysis of cross-sectional data from an online survey administered to a sample of 100 African American women. I hypothesize that a majority of the African American women will have experienced discrimination in the workplace at least once in their lifetime and that only a minority will have legally addressed the discrimination. Further, I hypothesize that the women will employ similar sets of mechanisms to cope with employment discrimination, including religion, familial support and settling (i.e., overlooking the racism and keeping their feelings to themselves).

The End of Analog Electronics for Positron Annihilation Lifetime Spectroscopy

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David B. Cassidy
Department of Physics and Astronomy

Technological advances in the production of commercial digital storage oscilloscopes have made it possible to create fast timing systems without using analog electronics. This considerably simplifies such systems and can lead to an improved time resolution. We describe here the initial construction and testing of a digital positron lifetime spectrometer. The system consists of two BaF$_2$ scintillator crystals attached to XP2020 photomultipliers, a 500MHz, 4 GSa/s digital sampling oscilloscope, a computer, and software with on-line and off-line capabilities. The lifetime of positrons produced from the decay of a $^{22}$Na test source are determined using a 1.27 MeV nuclear gamma-ray as a start signal, and one of the two 0.511MeV gamma-rays originating from positron annihilation as a stop signal. This apparatus is straightforward, easy to construct and allows for the implementation of a broad range of digital sampling techniques. Our preliminary arrangement yields a time resolution of <1 ns, largely determined by the approximate peak detection routines in place. With more sophisticated analysis routines, which are in development, we anticipate a time resolution of ~ 0.5 ns. This resolution, which will ultimately be limited by the sampling rate and bandwidth of the oscilloscope, is significantly lower than the state of the art (~ 0.15 ns), but will be more than adequate for future measurements of positronium (the bound state between a positron and an electron) formation in porous structures, which will have lifetimes in the 10-100 ns range.
Selective Adaptation May be Modality Specific

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Jasmine Singh
Sandy Gonzales
Victoria Chauvel
Psychology
Mentor: Lawrence D. Rosenblum
Contributors: James Diaz
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Selective adaptation to speech describes paradigms where repeated exposure to a linguistic stimulus results in a decline in the ability to perceive that stimulus along a speech continuum (Eimas & Corbit, 1973). For example, being repeatedly exposed to an audio “ba” stimulus results in more “va” responses along a audio “va” to “ba” continuum. However, if participants are adapted to an incongruent audiovisual stimulus, such as a visual-/va/-auditory-/ba/, a McGurk stimulus “heard” as “va,” listeners rate more “va” responses, suggesting that selective adaptation occurs only for auditory information (Robert’s & Summerfield, 1981; Saldana & Rosenblum, 1994). However, selective adaptation in speech perception has only been tested with auditory information. The current investigation utilizes an audiovisual continuum of 9 auditory-/ba/-visual-/va/ McGurk stimuli, varying in degree of salient visible speech information. First, baseline perceptions of speech sounds along the test continuum were measured. Then, two adaptation stimuli were tested between groups: An audio-/ba/-visual-/va/ McGurk stimulus, and an audio-only /va/ stimulus, both perceived (“heard”) as “va”. However, the McGurk adaptor is an illusory percept; “va” is never presented to the ear. Following adaptation, participants were again tested on their perceptions of the test stimuli. For the McGurk adaptor, participants adapted to the visual /va/ information resulting in more /ba/ responses, while in the audio-only /va/ condition there was no shift in perception. The results suggest that selective adaptation in speech perception is not an auditory only phenomenon, but can also occur for visual speech information.

Corridos Sanguinarios: Generation AK-47

Yessica Garcia Hernandez, Chicano Studies
Mentors: Jonathan Ritter
Department of Music
Alfredo Mirande
Departments of Sociology and Ethnic Studies

Following Felipe Calderon’s proclamation of a War on Drugs in 2006, Mexico experienced a rapid increase in drug-related deaths and violence. As this violence has increased, there has also been a rise in different sicario (assassin) narrative practices that include narcocorridos, YouTube videos, movies, and narco blogs. It is important to understand the influence of this mixed media boom, as it has the power to depict sicarios in multiple ways to a variety of audiences. In this project, I analyze the portrayal of sicarios in different mixed media, examining the role that media representation plays in understandings of the violence itself. I ask whether narco cyber culture can be used to influence youth to join in the business of sicariato (assassination). This thesis addresses the following questions: Who is recruited and qualified to be a sicario? What role do sicario-corridos have in the recruitment of sicarios, and what role do they play in relation to the violence? Do sicario-corridos glorify, promote, arouse, incite, or mediate drug war violence? Can they, in fact, be regarded as weapons of violence themselves? I hypothesize that one important factor in the varied meanings generated by sicario-corridos is rooted in the location of their composition and performance. When sicario-corridos are played in Mexico, where the scale and intensity of drug-related violence is comparatively greater, they have a higher chance of promoting, arousing, and glorifying drug life. In contrast, in the United States, these corridos are more likely to mediate and even heal social violence.
Microfossils from the Parahio Formation of the Himalaya: Resolving the Conodont Age Paradox

Ian Gilbert, Geology
*Mentor*: Nigel Hughes
Department of Earth Sciences

Middle Cambrian microfossils from the Parahio Formation (Parahio Valley, Spiti and in the Zanskar Valley, Zanskar) of the Indian Tethian Himalaya are described and assessed. Well-exposed sections at these localities have permitted the establishment of a trilobite-based biostratigraphic zonation accredited to the middle Cambrian by Peng et al. (2009). This middle Cambrian attribution contradicts a report by Bhatt and Kumar (1980) which suggested a maximum age for the Parahio Formation of late Cambrian (Furongian) based largely on Conodonts. To address this apparent age disparity, the original material of Bhatt and Kumar (1980) was inspected and found to be misidentified. Additionally, new fossil-bearing carbonate samples were recovered from Parahio and Spiti sections, (including horizons sampled by Bhatt and Kumar), and were processed using acid dissolution. The recovered microfossils were then imaged using high-resolution Scanning Electron Microscopy, allowing descriptions and taxonomic assessments of the microfossils which occur alongside the trilobite specimens used to establish the biozonation. Processed carbonate samples contained several microfossil taxa, including representatives of the following groups: Chancelloriidea (genera Chancelloria and Archiasterella of the enigmatic group Coeloscleritophora), Monoplacophora, Hyolitha, hexactinellid sponge spicules, and Brachiopoda. However, no Conodont or Paraconodont specimens have been recovered. These microfossil determinations support the middle Cambrian age for these formations as proposed by Peng et al. (2009) and refute the late Cambrian age suggested by Bhatt and Kumar (1980). This is the first study to describe and assess Chancelloriidea within the Cambrian of the Tethian Himalaya. This microfossil data could be important for future biostratigraphic purposes.

Experimental Investigation of Flow through a Porous Vegetation Model

Eric Gutierrez, Mechanical Engineering
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Department of Mechanical Engineering

Understanding the behavior of flow when it propagates through porous vegetation is of great interest for many applications in flow and transport, as it would bring further insight into the dispersion of different materials within forests. Water channel experiments were conducted with the goal of obtaining better understanding of flows through forests. Particle Image Velocimetry (PIV) was used for comprehensive flow measurements within a modeled array of trees. Trees were modeled using plastic and sponge material for the trunks and leaves, respectively. A total of 45 trees were situated in a regular 5 x 9 array. The average distance between the center of each adjacent tree was 83 mm, and the average height of each tree was 80 mm. The horizontal velocity of the flow was observed to decrease as it progressed through the model forest, as expected. However, the flow experienced an abrupt acceleration midway the tree array but continued to decrease again after this increase in velocity. Further investigation into the vertical velocity of the flow showed a mean updraft outflow for the first half of the tree array followed by a mean downdraft inflow in the lee of all succeeding rows of trees. This is the first time that such detailed measurements are available. Detailed methodology and results will be presented.

The Complexities of "Community Gardens"

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Chicano Studies, Women’s Studies
Sandra Robles, Women’s Studies
Stephanie Flores-Casas, Anthro, Women’s St.
*Mentor*: Chikako Takeshita
Department of Women’s Studies

This research seeks to address the complexities of a "community" garden through an analytical lens. Community gardens can be a place where education takes place while growing food. The main purpose of our research project is to
identify the benefits of community gardens, address the areas where there could be improvement, and to propose solutions, so that the community as a whole can benefit from this experience. A garden can teach us more than just how to grow food, it is a place where educated people from distinct backgrounds assert their rights and ability. Unfortunately not everyone participates in community gardening. Through several preliminary interviews in the Inland Empire, we found that awareness is the primary factor that determines who partakes in a community garden and who is left out. When people understand the benefits of community gardens and the shortcomings of our current food system they are more likely to become involved in a community garden. After conducting participant observations in selected community gardens around Riverside, we will propose ways to encourage a broader range of participants to become part of the "community."

Inaugural Bioengineering Consultancy

Hennessey Harrington
Business Administration, Financial Economics
Mentors: Sean Jasso
School of Business Administration
Hyle Park, Bourns College of Engineering

The biotechnology industry hinges on a symbiotic relationship between science and businesses. The most ground-breaking products are useless if they cannot be brought to market, meanwhile markets cannot survive without perpetual research and development. In contemporary academia there is a vast divide between research sciences and business administration. Students rarely get exposure to ideas and skills outside of their disciplines. The Inaugural Bioengineering consultancy has sought to address this issue by pairing engineers with business students in a collaborative effort to bring the engineer’s innovative senior design products to the competitive market. The program consisted of eleven senior design teams in which 1-2 School of Business Administration students served as business consultant to create mach companies. The 11 teams generated business plans complete with marketing strategies, financial projections and competitive positioning for their products. The collaboration challenged the students to step out of their discipline and learn how to work together to enter a competitive space within their respective markets. Engineers needed to communicate their designs to the business students in a way that allowed the business students to create a brand and identity for their firm.

An Irrationally Motivational Approach to Davidsonian Weakness of Will

Kevin Harrison, Philosophy
Mentors: Andrews Reath, Michael Nelson
Department of Philosophy

In Euripides’ play Medea, the title character famously says, “I know that what I am about to do is bad, but anger is master of my plans…” This is a classic example of Weakness of the Will. Explaining this phenomenon has challenged philosophers since Socrates. Donald Davidson famously offers a theory that involves taking sets of reasons into an “all things considered” judgment in favor of some action A, which then leads an agent to make an “unconditional” judgment to do action A. A person who suffers from weakness of will, or who is incontinent, does not make the transition between the all things considered judgment and unconditional judgment. He instead forms the unconditional judgment that action B is best, but on the basis of the all things considered judgment does action A, which according to Davidson, is irrational. Christine Tappolet, based on an article by Richard De Sousa, attempts to offer an explanation of this irrationality through emotions. While I believe Tappolet correctly identifies emotions to be involved in akratic action, she does not properly characterize why emotions are significantly different than desires and beliefs, thus allowing them to have the role in practical reason she suggests. My project is to explain this improper characterization, which I believe will give new insight into weakness of will and practical deliberation.
Using health-based interactomes to analyze the symptoms reported by electronic cigarette (e-cigarette) users in online forums

My Hua
English, Biology
*Mentor:* Prue Talbot
Department of Cell Biology and Neuroscience

Since the introduction of the electronic cigarette (or e-cigarette) into the world market in 2006, there have been few studies focusing on the health effects of these products. Generally, e-cigarettes consist of three major components: a battery, an atomizer, and a cartridge filled with nicotine and propylene glycol (also known as e-liquid). Because these products do not burn tobacco, proponents claim that they have few adverse health effects on users. This project examined individual e-cigarette users health symptoms reported through online e-cigarette community forums and correlated positive/negative health effects to body systems. In the largest database that we examined (Electronic Cigarette Forum), over 1,000 primary forum entries from users were sorted and analyzed. Our data currently show 11 major organ systems are affected by e-cigarette use. Most users reported negative symptoms; however, positive effects were also reported. The six systems most often affected were: nose/mouth/throat, respiratory, neurological, digestive, integumentary, and sensory. We also determined which symptoms were reported most frequently. For more detailed analysis, data were input into Cytoscape software and interactions between symptoms and systems were further analyzed. Our data show that a significant number of adverse health effects have been reported by e-cigarette users and that these effects occur in at least 11 different organ systems.

Exploring the 1993 Klamath Falls Earthquake with inSAR

Jaime Jordon
Geophysics
*Mentor:* Garth Funning
Department of Earth Sciences

The Klamath Falls region in Oregon experienced two magnitude 6.0 earthquakes on September 21, 1993. The earthquakes took place within the Lake of the Woods fault system, an east-dipping normal fault system which was monitored by regional seismic stations during the earthquakes and locally by temporary stations installed days after the main shocks. However, accurate earthquake epicenter locations were not available through seismic data, given the relatively sparse regional monitoring network in place at the time. In this study we use remote sensing data to find a more accurate location for the Klamath Falls earthquakes. We produce a SAR interferogram using European Space Agency (ESA) satellite radar data to measure the combined surface displacement of the two earthquakes. We observe a maximum surface subsidence of 12 cm, located 20 km to the northwest of the city of Klamath Falls consistent with the expected normal sense of fault slip. We then invert a subset of these data using an elastic dislocation model to determine the set of earthquake source parameters, such as strike, dip, depth, and location, which predict a good match to the surface deformation present in the interferogram. In this way we find an updated, more accurate location for the two Klamath Falls earthquakes. We find that published locations of the earthquake from seismic data are offset from our model by 17 km. Our improved locations will be useful for validation of regional and global seismic velocity models.
Hugo Chavez: The Best Economist For Venezuela?

Laila Kamali, Public Policy
*Mentor:* Steven Helfand
Department of Economics

Abstract: This paper analyzes economic performance in Venezuela under Hugo Chavez compared to that of his predecessors using Habermas’s model of legitimation crises. The paper primarily focuses on social and economic policies and their respective effects on poverty. Juxtaposing the failures and successes of Chavez to those of previous leaders in Venezuela, the paper examines the emergence of Chavez, his education and healthcare reform, the effects of the oil crisis in 2002, and the political infrastructure through which he pushed his policies. The paper concludes with reflections on the effects of policies on poverty, and the usefulness of Habermas’s model as a tool for understanding the evolution of policy in this period.

Comparative Water Loss Rates of Turkestan and Oriental Cockroaches

Tina Kim, Entomology
*Mentor:* Michael Rust
Department of Entomology

This research focuses on the physiological ecology of two invasive species of cockroaches: *Blatta lateralis*, commonly known as the Turkestan cockroach, and *Blatta orientalis*, the oriental cockroach. It has been reported that the Turkestan cockroach is replacing the oriental cockroach in the southwest as the most important pest species around structures. The objective of the research was to determine if Turkestan cockroaches were more arid adapted than oriental cockroaches. Both species lost about 10% of their total body water content in 24 hours and had a cuticular permeability of about 16ug water/cm²/hour/mmHg. Both species are highly adapted to the Mediterranean climate of the desert southwest.

Computationally Evaluating Effects of Osteoconductive Bulking Agents on Stress Distribution in Reconstructed Mandible

Ryan Kozaka, Bioengineering
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Previous studies of thirteen Rhesus Macaque monkeys were used to evaluate different forms of an osteoconductive bulking agent (compression-resistant matrix (CRM)) in a critical-sized mandibular defect. Our research focuses on a finite element model (Comsol Multiphysics V3.5) which examines the efficiency of the CRM complex. We computationally model these matrix complexes to capture the von Mises stress as well as the deformation along the maxillary jaw. We have successfully implemented a 2-D mesh into the simulated maxillary jaw consisting of 8093 mesh elements. The model mimics jaw clenching by applying a force on the tip (689.48 kN/m) of the tooth and a rotational force at the hinge of the jaw. Subdomain conditions such as the density, Young’s Modulus, and the Poisson’s ratio were physiologically set. A separate subdomain within the jaw was modeled to represent the regenerative CRM complex defined with its physical properties. Preliminary computational analyses illustrate that the density and the Young’s Modulus of the regenerative subdomain plays a role in the von Mises stress as well as the deformation in the jaw. Further, density values and Young’s Modulus were experimentally obtained using a Pycnometer and Material Testing System respectively. To predict the shear stress distribution of the regenerated mandible, we will further import images from MRI scans (Amira V5.2.2) of the performed experimental trials and input the experimentally obtained material properties into our computational model. The results will identify the regenerative CRM complex that withstands the physiological loading force of jaw clenching by defining their mechanical properties.
Abstract - Nitrogen Fixation of Biological Soil Crusts from the Mojave Desert

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Mentors: Robert Graham
Department of Environmental Sciences
Louis Santiago, Botany and Plant Sciences
Contributors: Nicole Pietrasiak
Department of Environmental Sciences
John Regus, Department of Biology

Desert ecosystems are water and nutrient limited. However, biologic nitrogen fixation carried out by organisms living within biological soil crusts can increase soil fertility in these systems. Ongoing research in Dr. Graham’s lab has recognized eight morphologically distinct crust types in the deserts of California. The objectives for this study were: 1) to determine which crust types are capable of fixing significant amounts of nitrogen from the atmosphere and 2) to obtain the rate of nitrogen fixation for each crust type. Five replicates of all eight crust types were collected at random from a study site in the Mojave Desert. Crusts were wetted and placed into artificial microcosms. Stable isotopic labeled nitrogen gas (N\textsuperscript{15}) was applied to the atmosphere in the microcosm and incubated for 48 hours in a light/dark cycle. Incorporation of labeled nitrogen gas into crusts was determined by mass spectrometry. We found that cyanobacterial lichen crusts are the most efficient at nitrogen fixation with an estimated fixation rate of 1.3 kg/yr/ha. In all other crust types nitrogen fixation was negligible. We conclude that areas supporting cyanolichen crusts may be more fertile in terms of soil N than other areas lacking this crust type.

Families that discontinued TANF during the Great Recession: A Study of Riverside County

Young Lee, Sociology
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Department of Sociology

Since the Great Recession, scholars have questioned the role of Temporary Assistance for Needy Families as an effective safety net for families. Despite recent unemployment rates and TANF caseload growth in some states (2011), TANF’s policy continues to aim for the elimination of “welfare dependence” by emphasizing employment. As family composition of welfare caseloads change during economic downturns, it is important to examine whether TANF’s goals serve the different family types. Taking Riverside County as a case study, this thesis examines whether two-parent families have increased during the recession (assuming recent male unemployment has impacted the increase). Since the male employment sector has been hit particularly hard by the recession (2011), the first hypothesis is that two-parent TANF caseloads have increased after 2008. In addition, this study explores how the recession affected the rate of TANF discontinuances due to earnings increase differently, depending on family type (two-parent, zero-parent, or ‘all other’). Using state report data, this study implements the Interrupted Time Series Design to compare the slopes of TANF discontinuances at the pre-recession, recession and post-recession time periods. Studies on welfare dependency show that barriers to work such as family responsibilities or single motherhood tend to increase reliance on welfare (2006). Hence, the second hypothesis is that the recession had a negative effect on single-parents’ ability to leave TANF due to increased earnings, while it did not have a significant effect on two-parent families’ ability to exit TANF due to increased earnings.

Life During and After Collegiate Athletics

Jazzmin Lewis, Political Science/Law and Society
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Department of Political Science
Scott Brooks
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College sports are a large part of American society’s entertainment world. They bring in an immense amount of revenue for colleges and universities around the world. The athletes, who are apart of college sports, work hard and make
many sacrifices in an effort to entertain the public and bring success to their institutions. My research seeks to explore more than just the entertainment and revenue generating aspects of college sports. I believe most would agree that the main goal for colleges and universities should be to prepare students for the "real world". However, based on in-depth interviews and surveys, I will provide facts that support the notion that in an overwhelming number of instances, student athletes are not being properly prepared for "real life" after college, as it relates to preparing for establishing a career, continuing their education at the graduate or professional school level, and in many cases, they simply are not being prepared to appropriately handle the responsibilities of being a fully functioning adult. In fact, in too many cases, they receive very negative responses to their desire to prioritize academics, social activities, community service or work experience, etc. Without the ability to take part in these activities and invest some time into developing skills that will help them in the future, how can we expect student athletes to be prepared to handle life’s issues after college athletics? My thesis will explore options for providing athletics with the needed support in preparation for their lives after athletics.

Site Response in the Bíobío Region, Chile Using the κ Method

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We assess local site response in the Bíobío region of Chile utilizing seismograms recorded by the Quake-Catcher Network (QCN) micro-electro-mechanical system (MEMS) accelerometers during the aftershock sequence that followed the February 27, 2010 Mw 8.8 Maule earthquake. The earthquakes were captured by over 70 QCN low-resolution seismometers from March 1 to June 1, 2010. Site effects are caused by the local amplification of seismic energy due to subsurface structures and geologic materials, which often result in spatially variable patterns of surface damage following an earthquake. In this study we estimate kappa, κ, which models the decay of the acceleration spectra to characterize strong ground motion at high frequencies (> 1 Hz). We calculated the Fourier spectra and κ for each station following the method of Douglas et al. (2010). During the aftershock deployment, the QCN network recorded over 229 earthquakes of magnitude 4.5 and greater. Of these recordings, we determine that 57 earthquakes (25%) have sufficient signal-to-noise quality for use in site response analysis. Results indicate κ values between 0.03 and 0.06. These values suggest that the Bíobío region of Chile is sharply attenuating and likely consists of less competent rock, as expected. Further comparison of κ values between stations will also highlight the influence of local geology on observed seismic records at individual sites in the Bíobío region. As a result of the site response analysis, we highlight areas of the Bíobío region that may be more susceptible to greater ground shaking following future large earthquakes.

One Step Fischer-Tropsch Gasoline Production from Clean Syngas: Preliminary Results

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The Fischer-Tropsch Synthesis (FTS) converts carbon monoxide and hydrogen into synthetic fuels through a series of catalytic thermochemical reactions. The fuel products are long chained paraffinic hydrocarbons predominantly in the range of C12 to C20+ depending on the specific catalyst used and
operating conditions. The hydrocarbon fraction above C20 is a paraffinic wax and requires further processing to convert to the liquid fuel range. The objective of our research is to explore the use of a traditional FT catalyst within a novel zeolite shell designed with a specific pore size to produce high quality gasoline in the C6-C12 hydrocarbon range. The zeolite shell acts as a hydrocracking and isomerization catalyst, eliminating the need for additional chemical refining. The experiment is monitored by a specialized PID controller. The proportional and derivative values are adjusted when the slope of the catalyst’s temperature begins to rapidly increase to prevent the temperature from fluctuating. We constantly supervised the catalyst and reactor’s temperatures to avoid having a temperature runaway and decreasing efficiency. Adjustments made during the reaction were miniscule and introduced slowly over the time span of one to eight hours. The proportional value was the predominant parameter used by decreasing the output until the temperatures became stable. The results of the initial experiments designed to determine the product distribution, the synthesis gas conversion rate, and the initial durability and lifetime of the zeolite catalyst will be presented. This research, if successful, will provide an economically viable pathway for sustainable gasoline from thermochemical processes.

Characterization of Low Molecular Weight Heparin Oligosaccharide Chains

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Department of Chemistry

Heparin is an unbranched, long-chain, highly negatively charged polysaccharide that is part of the glycosaminoglycan family. A series of enzymatic reactions during its biosynthesis contribute to its microheterogeneity and polydispersity through sulfation and epimerization at various positions. Heparin is known for its anticoagulant activity and is often used as a treatment for blood clotting. Heparin's anticoagulant activity occurs through the electrostatic interactions between a specific pentasaccharide sequence and basic amino acid residues within the serine protease inhibitor, antithrombin III. Due to its complex structure, enzymatic or chemical depolymerization is used to break heparin into smaller oligosaccharides more amenable to molecular-level characterization. In our experiments, we are using various techniques to separate and examine the components of a chemically digested, low molecular weight heparin, Enoxaparin. Characterization of the differently sized oligosaccharides is accomplished using size exclusion chromatography (SEC) to first separate Enoxaparin components into size-uniform fractions. The various substitution patterns of the negatively charged sulfate groups allow us to further separate these components into charge-uniform fractions by strong anion exchange high performance liquid chromatography (SAX-HPLC). These individual fractions are then subjected to complete structural characterization by mass spectrometry and NMR. Two-dimensional NMR, such as COSY, TOCSY, and ROESY, are used for complete assignments of the $^1$H NMR resonances and the $^1$H,$^{13}$C HSQC permits characterization based on unique $^{13}$C chemical shifts. Once characterized, the secondary structure of these oligosaccharides can be investigated through NMR measurements of the chemically exchangeable sulfamate and hydroxyl protons.

Validation of Xenopus laevis Monoclonal Antibodies in White’s Treefrog, Litoria caerulea

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Amphibian populations have been declining across the globe for decades. Many of these declines have been attributed to emerging infectious diseases such as chytridiomycosis, a fungal skin infection, suggesting that a greater understanding of amphibian immune function is necessary. To better characterize the amphibian
immune response, we used monoclonal antibodies (mAb) to determine what membrane-bound proteins are expressed among the population of immune cells extracted from frog spleens. Available mAb for amphibians are raised against the model species *Xenopus laevis* presenting a conflict for researchers working with other amphibian species. Despite species specificity, mAb cross-reactivity among taxa is not uncommon. Thus, we set out to determine whether *X. laevis* mAb will label immune cells in White’s treefrog, *Litoria caerulea*. Preliminary data suggest that a treatment of 100 µL of mAb can label immune cells in the *L. caerulea* spleen, facilitating further studies into immune function and immunosuppression in White’s treefrog.

**A p21 Reporter Plasmid for Assessing Beta-Catenin/FoxO3A Target Gene Expression**

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Helen Nguyen, Biology
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*Mentor*: Nicole zur Nieden
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Wnt/B-Catenin pathways are critically important for a variety of developmental processes and thus elucidating the mechanisms by which they control stem cell fate decisions can help to decipher many of the mysteries behind proper versus problematic embryonic development. For example, it has been hypothesized that disruptions in Wnt/B-Catenin signaling may be partially responsible for the problems associated with infants born to diabetic mothers, but the specific mechanisms which underlie these processes have yet to be determined. Previously, our lab has shown that under high glucose conditions (4.5g/l), Forkhead Box O3a (FoxO3a) localizes to the nucleus where it binds to Beta-Catenin activating target genes. In order to examine the levels of the FoxO3A target gene p21, we transiently transfected cells with a Pp21:Luciferase plasmid and tracked luciferase expression in different glucose concentrations. We found that p21 expression increases with increasing glucose expression, confirming that glucose-dependent increases in nuclear FoxO3A do, in fact, correlate with increases in activity of FoxO3A Beta-Catenin target genes. In order to expand on these studies, we then cloned a neomycin resistance cassette into our plasmid and are currently working on stably transfected the plasmid into embryonic stem cells in order to create a Pp21:luciferase stem cell line. Future studies using this stem cell line will be aimed at determining how glucose dependant FoxO3A/Beta-Catenin interactions affect cell cycle regulation and how this, in turn, affects stem cell fate.

**Poverty in Post-War Mozambique: The Role of Decentralization Policy**

Miellette McFarlane, Economics
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Department of Economics

This paper analyzes government policies to address the extreme incidence of poverty in Mozambique in the period following 26 years of nearly continuous warfare. Analyses of data collected from two comprehensive national household consumption surveys conducted in 1996/97 and 2002/03 were examined along with case studies done on decentralization policy, the presence of microfinance, and access to wage labor. The paper concludes that the government’s decision to implement decentralization policies to decrease poverty rates in rural areas by promoting the production of small farmers has been the most effective in bringing down national poverty rates.

**Refining Potassium Niobate Powder to Increase Density of CAPAD Processed Electro-Optic Materials**

Jason R. McMillan, Mechanical Engineering
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Department of Mechanical Engineering

Electro-optic materials are used in a variety of applications such as optical switches and light modulators. These materials are difficult to make in bulk polycrystalline form; usually they are produced as single crystals or thin films. One of the most widely used electro-optic
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material is potassium niobate (KNO). The Current Activated Pressure Assisted Densification (CAPAD) technique is known to be an effective method of processing difficult to consolidate materials. In this study the CAPAD technique is used to densify KNO powder into bulk form. It has been shown that the grain size of the starting powder can affect the density of the bulk product after CAPAD densification. The density of the bulk product greatly influences the electro-optic and other material properties of the samples. Powders of the specific grain size needed for successful CAPAD densification are not readily available for purchase. In this study, planetary ball milling was used to refine commercially available KNO powder. By varying the parameters of the ball milling, the grain size of the powder may be changed, which affects the density of the bulk material after CAPAD processing. As the powder grain size decreases, an increase of bulk sample density is expected. The densities of the resulting bulk materials were measured and compared with respect to ball milling and CAPAD processing parameters.

Enhancement of the Optical Clearing Properties of Glycerol for Drug Delivery using High Temperatures and Microneedling

Bissrat Melakeberhan, Biology
Mentor: Guillermo Aguilar
Department of Mechanical Engineering

Optical clearing agents (OCA) such as glycerol are widely used to improve optical diagnostic and therapeutic applications. Our goal is to enhance the use of OCA in percutaneous drug delivery methods to reduce the time period of optical tissue clearing and increase the penetration depth of biomedical lasers. First, microneedles were used to increase the permeability of the stratum corneum and allow for increased OCA penetration. Second, heating glycerol reduces its viscosity which allows for easier diffusion of OCA through the skin. In order to verify this hypothesis, we tested the combined impact of temperature and microneedling on the optical clearing properties of glycerol on porcine skin. This was done by using a range of temperatures of glycerol (20, 30, 40, and 45oC) as well as microneedling the porcine skin. The change in clearing was measured over 60 minutes in 20 minute intervals using a reflectance and transmission spectrometer. Our results indicate that increasing the temperature positively impacts the optical clearing efficacy of glycerol. Furthermore, microneedling tissue samples with or without heat improves clearing efficacy.

A Flaw in the Law: A Study of Legislative Responses to Femicide in Ciudad Juarez, Mexico

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Mentors: David Pion-Berlin
Department of Political Science
Freya Schiwy
Department of Media and Cultural Studies

Since 1993 femicide; the torture, mutilation, and murder of a woman simply because she is a woman, has claimed hundreds of lives in Northern Mexico. There are many theories as to why the murders began and continue, ranging from satanic clubs to unemployed and resentful men. Much of the current literature offers social or cultural solutions while very few focus on legal responses. First, by examining in detail four of the most popular theoretical causes of femicide in Ciudad Juarez, this paper will present the difficulties in creating legislation against the phenomenon. Second, by using the information from the causes, this paper will analyze the current laws against femicide in an attempt to show whether or not they are following an accurate investigation of the causes. Since the numbers of femicide cases have risen despite the new laws in place, their validity is brought into question. The current work questions whether or not this is due to a misinterpretation of the causes of femicide or something much deeper.
The Legal Controversy on the Definition of “Obscenity:” The Contribution of a Computational Semantic Analysis

Justin Miclat, Psychology
*Mentor: Curt Burgess, Psychology*

Though the shift from a national to a community standard of definition occurred nearly four decades ago, the boundaries of 'obscenity' are still a considerably gray area at the legal as well as the academic level. The landmark Miller tests granted a certain sense of freedom from the entrapments of previous national definitions (Memoirs vs, Mass, 1966, Roth vs, U.S., 1957) but the issue is still compounded by a persistent debate over a lack of First amendment protection. Subjectivity, obviously, remains an unresolved issue when these types of decisions are made. Empirical research has attempted to temper these debates in trying to decipher the effectiveness of the aforementioned shift, yet the same questions remain. One problem is the meaning is connotative and dependent on context rather than denotative. A recent development in cognitive science is how computational models of meaning have evolved such that a semantic model can learn word relationships by the statistical regularities in language. They do not have to have meaning “programmed” into the system. The meaning relationships in the model are connotative. In the first analysis, the semantic neighbors of obscenity were retrieved in order to determine if the basic concept has more relationships to words related to pornography or violence. The second analysis included the comparison of the semantic distances of sets of words that in order to determine if these words formed distinct categories.

**Synthesis of Syrbactin Analogs as Possible Alternative Treatments for Cancer**

Nicole Mikulski, Chemistry
Michael Pirrung
Department of Chemistry

In recent years, natural molecules glidobactin A, and syringolin A and B, also known as syrbactins, were discovered to have the ability to inhibit the proteasome within cells. The proteasome is a large protein complex within all cells, whose function is to degrade and dispose of unnecessary and abnormal proteins that are not needed for cellular function. Recently, research has been conducted with molecules that can inhibit the proteasome as a treatment for cancer. Inhibiting the proteasome causes an overload of proteins within cancer cells, disabling the cell’s ability to replicate and causing it to die. In recent years, glidobactin A, and both syringolin A and B, have been successfully synthesized in the laboratory and have been shown to inhibit cancer cell growth through inhibition of the proteasome. Following previous syrbactin synthesis procedures used in the Pirrung laboratory, various syrbactin analogs were synthesized to better understand which aspect of the molecules contribute to proteasome inhibition abilities. Once synthesized, the syrbactin analogs will be tested to determine their properties—the effectiveness of the absorption into cells, and proteasome inhibition abilities—to determine if the modified aspects increase the effectiveness and potency of the molecule as a proteasome inhibitor. The goal of this research is to determine whether the syrbactin analogs will have an improved effect of inhibiting the proteasome to cease cancerous cell growth so that it can be used as an alternative treatment for cancer.

**The Testing and Improvement of Prescribed Fire Emissions Modeling for the American Southwest**

Robert Moore, Mechanical Engineering
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Department of Mechanical Engineering
*Contributor: Hector Gonzalez, Mech. Eng.*

Prescribed burns have many beneficial functions such as wildfire prevention, farmland renewal, and habitat restoration. However, if prescribed burns are done near an inhabited area, the smoke created could contribute potentially hazardous chemicals into the surrounding atmosphere. The government departments that conduct many of these burns such as the DOD (Department of Defense) and the Forest Service are turning to the science community for models that can
accurately predict prescribed fire emissions and dispersion. Using the Forest Service’s newest fire modeling tool, the BlueSky Framework, this project modeled prescribed burns at VAF (Vandenberg Air Force Base) and Ft. Huachuca and compared them to empirical data collected from these burns. The burns were part of a DOD funded project called SERDP, whose aim is to analyze and characterize the fuel loading, consumption, and emissions for the American Southwest region. The main goal of this modeling project was to research the algorithms that made up the various modules in the BlueSky framework and determine if it was capable of accurately modeling emissions from the SERDP prescribed burns. Preliminary findings for this ongoing project suggest that the BlueSky framework did not accurately estimate prescribed burn emissions. A major source of discrepancies was due to the FCCS (Fuel Characteristic Classification System) module and how it selected the fuel beds. Fuel consumption and subsequent emission estimates therefore deviated. The next steps for this project will be to improve the various modules that exist inside the framework so that prescribed fires can be more accurately modeled.

Separation of UDP-3-O-Methyl-L-Rhamnose Fraction Taken From a Physcomitrella patens

William Moore, Plant Biology
Mentor: Eugene Nothnagel
Department of Botany and Plant Sciences

This project is a biochemical investigation of certain complex carbohydrates present in the cell wall of Physcomitrella patens, a seedless non-vascular plant. This moss is of particular interest because arabinogalactan proteins (AGPs) in its cell wall contain an unusual methylated sugar, 3-O-methyl-L-rhamnose (3-O-Me-Rha), which is not found in more advanced flowering plants. The AGPs are glycoproteins with branched arabinosyl- and galactosyl-rich glycan chains, some of which carry 3-O-Me-Rha as terminal residues. The long-range goal of this project is to elucidate how Rha becomes methylated to form 3-O-Me-Rha. Does this methylation event happen before or after the sugar is added to the growing glycan chains of AGPs? We hypothesize that methylation occurs at the level of uridine-diphosphate (UDP)-Rha, the form in which Rha is activated prior to incorporation into polymers. If this hypothesis is correct, then UDP-3-O-Me-Rha should be present in moss. Evidence consistent with this hypothesis is our finding of 3-O-Me-Rha in a total nucleotide diphosphate sugar (NDP) fraction prepared from moss homogenate by anion exchange chromatography. More conclusive evidence for the presence of UDP-3-O-Me-Rha requires further separation of the NDP-sugars. Current work is focused on combining a preparative reversed phase liquid chromatography column with an ultraviolet absorbance detector to accomplish this separation. The efficacy of the separation is being evaluated with model mixtures of UDP-sugars prior to applying the NDP-sugar fraction from the moss. This project is supported by the National Research Initiative competitive grant no. 2008-35318-04599 from the USDA National Institute of Food and Agriculture.

Educational Attainment Level Effects on the Los Angeles County’s Student Population

Shyamal Naik, Sociology
Mentor: Professor Swanson
Department of Sociology

This project focuses on the urban area of Los Angeles County (LA County). Particularly, its sole concentration will be on the amount of educational attainment level and enrollment of various ethnic students: American Indian/Alaska Native, Asian, Pacific Islander, Filipino, Hispanic or Latino, African Americas, White (not Hispanic), and Multiple or No Responses within the eighty-three school districts. Moreover it will study the fluctuation in enrollment and educational attainment level throughout a consecutive five-year period: 2000 to 2005. The population that will be studied ranges from students in kindergarten through high school—standards K-12; students in this cohort population generally range from ages five
to seventeen years. The research found that there was a great variation in enrollment levels among the LA County school districts. The student population with the highest enrollment rate among grades K-12 consisted of the Hispanic or Latino ethnicity. The second highest enrolled students were the White (not Hispanic) students. Both of these ethnic groups had consistent and the highest enrollment rates throughout the five-year period. However the other six ethnic groups’ enrollment rates inconsistently fluctuated throughout the five-year period. An improper education could potentially hinder our society and country. Given that, education is a fundamental and crucial aspect within our society that should be regularly studied. It is vital to see the progression and active involvement of ethnic groups in their continuation of further education. It is especially important to study given LA County is one of the largest and ethnically diverse counties in the United States.

Native American Visibility and Infant Mortality

Alanna Ocson, Global Studies
Mentor: Chikako Takeshita
Department of Woman’s Studies

Native Americans have a higher than average percentage of infant deaths than other ethnicities. Native Americans experience an infant mortality rate of 9.22 deaths per 1,000 births, second only to Non-Hispanic Blacks who have a rate of 13.31 deaths per 1,000 births. Data show that the lower life expectancy, compared to other ethnicities is a result of reservation living, inadequate education, disproportionate poverty, lack of health services and the failure to understand their cultural differences. Though Native American infant mortality has only a small difference compared to African Americans, the visibility of their plight in the media varies greatly. This study will present the health disparities that account for the high infant mortality rates of Native Americans. It will illustrate the dire conditions of reservation living and other challenges they face to get proper health care. Furthermore, the study will investigate how lack of public awareness and the resulting indifference toward the plight of Native Americans exacerbate the problems of inadequate health care. I will look at three major American newspapers and compare the number and types of articles they have about both Native Americans and African Americans and their health. I argue that more attention needs to be paid to the high infant mortality rate in Native Americans and support be extended to their communities.

Rate of Degradation of Magnesium (Mg) Alloy Screws in Phosphate Buffered Saline (PBS)

Tejas Patel, Bioengineering
Maria Iskandar, Bioengineering
Mentor: Huinan Liu
Department of Bioengineering

Current metallic orthopedic implants include stainless steel, titanium, and cobalt-chromium based alloys. Although these materials are effective in securing fractures, they also possess many disadvantages. They can slowly break apart into toxic ions which can lead to local inflammation. Moreover, they require a second surgical procedure for removal after they have served their purpose. Magnesium (Mg) alloys are a great alternative to these metallic implants. They are biocompatible, biodegradable, and can promote new bone growth. Moreover, their light weight and mechanical resemblance to bone make them an ideal material for orthopedic implant applications. However, their rapid degradation in the physiological environment is a major obstacle. In this study, pure Mg, AZ31 (3% aluminum, 1% zinc), and Mg-4Y (4% yttrium) were tested to determine the rate of degradation. Each screw was submerged with 3mL of PBS. 1x PBS was used for the first 15 days of the study. 10x PBS was used from 17 days through 31 days. Of the three metals, Mg-4Y was the first to completely degrade. Large pieces began to break off making it the worst alloy of the three. AZ31 showed the best improvement in degradation, followed closely by pure Mg.
Abscisic Acid Signal Transduction Analysis Through Agrobacterium Biotransformation

Salvador Ramirez, Environmental Science
Mentors: Sean Cutler, Assaf Mosquina
Department of Botany and Plant Sciences

The purpose of our research is to better understand the receptors involved in the abscisic acid (ABA) signal transduction pathway in Arabidopsis thaliana. What is known about ABA and its pathway is that it modulates different developmental processes and responses to environmental stress in higher plants. By utilizing Agrobacterium we are able to insert our gene of interest which is a receptor involved in the ABA signal transduction pathway in its constitutively active form. We can gain novel insights about the ABA pathway by working with transgenic plants that express constitutively active receptors because transgenic plants have the ability to respond to abiotic stress by signaling ABA, and we can measure its activity using single or multiple mutations in certain receptors. We can test the effect of single or multiple mutations in certain receptors in transgenic plants by stress testing Arabidopsis thaliana seedlings or plants by drowning them. By measuring the number and length of the auxiliary roots that elongate after being drowned for a set period of time, we can see what combination of proteins aid the seedlings in their response to drowning. Knowing the positive or negative regulators in the ABA transduction pathway would potentially allow us to create plants that would better respond to environmental stress.

Anti-tumor Mechanism of a Phen-based Drug

Andrew Rios, Biology
Shawnt Tosonian, Biology
Charles Ruiz, Undeclared CNAS
Elma Frias, Neuroscience
Mentor: Jack Eichler, Department of Chemistry

The polypyridal ligand 2,9-disecbutylphenanthroline (secbutylphen) has been found to possess significantly higher cancer cell cytotoxicity than cisplatin, a leading cancer therapeutic. To assess what anti-cancer mechanism secbutylphen undergoes, iron binding and removal experiments were considered. Previous research suggests that iron sequestration strategies may be useful in inhibiting tumor cell growth (e.g., the use of iron chelation for the treatment of bladder cancer via the use of the chelator gallium nitrate). A series of polypyridal ligands were reacted with iron(III) chloride to yield new iron complexes [(secbutylphen)Fe(Cl)2H2O], [(methylphen)Fe(Cl)2H2O], and [(phen)Fe(Cl)2H2O]. These model complexes were synthesized in order to compare the phen-based ligands’ ability to bind Fe, which was determined by competitive bonding with ethylenediaminetetraacetic acid (EDTA). However, characterization of iron complexes by elemental analysis and mass spectrometry indicate H[(secbutylphen)Fe(Cl)3], H[(methylphen)Fe(Cl)3] and H[(phen)Fe(Cl)3] were obtained. EDTA binding studies show that H[(phen)Fe(Cl)3] and H[(methylphen)Fe(Cl)3] complexes immediately release ligand upon addition of EDTA, whereas H[(secbutylphen)Fe(Cl)3] shows greater stability, with a slow decrease in the absorption maximum associated with the H[(secbutylphen)Fe(Cl)3] complex. Given the fact that phen and methylphen have limited anti-cancer activity, this suggests that the secbutylphen ligand may indeed impart tumor cell death by depleting intracellular iron reserves. Future work will involve using x-ray crystallography to verify the structure of the phen-Fe complexes, doing EDTA titrations with the complexes to determine the K_b (binding constant), and doing in vitro tumor cell assays with secbutylphen in the presence of Fe (secbutylphen bound with Fe would be hypothesized to have lower activity).
Molecular analysis of the interaction between immune evasive *Staphylococcus aureus* protein Sbi and immune system protein C3d.

Wilson Rodriguez, Bioengineering  
*Mentor*: Dimitrios Morikis  
Department of Bioengineering

Protein-protein interactions form the basis of cellular communication, signaling, and regulation. These interactions are governed by non-covalent forces, originating from electrostatic and van der Waals interactions at atomic resolution. Electrostatic interactions are often crucial to protein recognition and binding, particularly for highly and oppositely charged proteins. We examined the interactions between secreted protein Sbi from antibiotic-resistant strains of *Staphylococcus aureus* with host complement immune protein C3d, using electrostatic clustering and free energy analysis. We used the computational framework called Analysis of Electrostatic Similarities Of Proteins (AESOP) to perform computational alanine scans and we generated a series of protein variants with perturbed electrostatic properties. To elucidate the effect of each mutation in association (defined as recognition plus binding) of Sbi with C3d, we performed electrostatic clustering and association free energy calculations. The analysis of our data revealed which charged amino acids are important for the formation of the C3d-Sbi complex, thus pointing out gain-of-association or loss-of-association mutations. This knowledge will form the basis for the design of proteins with tailored binding properties, and thus tailored biological function, by incorporating multiple critical mutations. This project will guide the development of novel therapeutics for treatment of infections by *Staphylococcus aureus*.

 Strait-Laced Sephardim: The Ideologies of Tzniut Modesty Practices in Sephardic Orthodox Jewish Women of Brooklyn, NY

Jordan Rohde, Women’s Studies  
*Mentor*: Piya Chatterjee  
Department of Women’s Studies

Following up on last year’s undergraduate research symposium, I have continued to work with women in Middle Eastern Sephardic Jewish Orthodox communities of Brooklyn, NY—attempting to identify the importance of tzniut (modesty) and personal aesthetics codes in this community. The aim of this ethnography is to identify how modesty and personal choices of dress can act as a window to larger political and social themes and implications. Judaism is a matriarchal religion, and thus the Sephardic Orthodox Jewish fertile female body is the tool used for building the Sephardic Jewish nation. Adding on to the responsibility to nation-build, the female observer of tzniut takes the religious usage of her body further by exercising her understanding of piety and purity through the covering of her body. This specific community is unique in that some women have fully adopted tzniut codes of wearing wigs, full length skirts and high necklines, whereas other women in the same community dress in American secular style clothing—pants, short sleeves, and no head covering to speak of. The gradient of clothing practices that exists in this community, reveals how individual agency is used in choosing to visibly express religious identity—which further illuminates another method in which the female body may be used as a tool for religious ritual practice. My hope is that this study will add to the larger body of academic knowledge on tzniut codes, and the implications of Jewish female modesty.
Electrospun Micro- and Nano-fibrous Scaffolds for Human Embryonic Stem Cell Culture

Bishoy Saad, Neuroscience
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Brandon Maraglia, Bioengineering
Duncan Liew Stem Cell Center

Traditionally, human embryonic or induced pluripotent stem cells are grown on animal-derived basement membranes or feeder cells from mouse, which hampers the therapeutic application of such stem cells. In this study, we investigated cellular activities of the stem cells on various synthetic scaffolds in order to enhance applicability for medical applications. Polycaprolactone, an FDA approved biocompatible polymer, was used to synthesize nano- or micro-fibrous scaffolds that resemble the morphologies of in vivo extracellular matrix by electrospinning. To further increase cellular adhesion, the scaffolds were conjugated with Collagen type I after plasma treatment. The morphologies of those scaffolds were characterized by SEM. Human embryonic stem cells, H9, were cultured on these scaffolds and their proliferation was monitored in comparison to those on the Geltrax (basement membrane derived from murine cancerous cells)-coated tissue culture plate at various time points. In addition, H9 was transfected with eGFP-OCT4 reporter gene to observe spontaneous differentiation of the cells by fluorescence microscopy. SEM revealed that the average diameters of nano-fibers and micro-fibers were 481 nm and 10 μm, respectively. The proliferation of H9 on these scaffolds was comparable to that on the Geltrax-coated plates without inducing spontaneous differentiation. Overall, these results present the opportunity to replace animal-derived products with synthetic scaffolds, which will facilitate the usage of stem cells in medicine.

Method Development for Isolation of Phosphorylated Sugars in Submergence Tolerant and Intolerant Rice

Ryan Salditos, Biology
*Mentors*: Cynthia Larive, Gregory Barding
Department of Chemistry

Recently, a rice cultivar was developed that is more tolerant to flooding than commercial rice varieties. The genetic mechanism of submergence tolerance has been established and can be attributed to a single gene (SUB1A), but the metabolic impacts of this gene have not yet been fully described. Targeted metabolite profiling of phosphorylated sugars in the tolerant and intolerant rice varieties will provide information essential for understanding their metabolic differences. Recent reports indicated that carbon allocation is influenced by trehalose-6-phosphate (T6P). Mixed-mode anion exchange (MAX) solid phase extraction (SPE) along with liquid chromatography – mass spectrometry (LC – MS) provides a way to isolate and quantify negatively charged molecules such as phosphorylated sugars. LC-MS analysis confirmed the utility of the MAX SPE cartridge for trapping phosphorylated sugars such as T6P, glucose-6-phosphate (G6P), fructose-6-phosphate (F6P), and fructose-1,6-bisphosphate (F1,6BP). However, we were unable to elute F1,6BP from the cartridge due to its strong interaction between the MAX material. Interference from unretained components was significantly reduced after washing the cartridge several times prior to elution of the phosphorylated compounds. Initial experiments with rice extracts revealed successful trapping of our internal standard, adenosine monophosphate, along with F6P and G6P, while components not expected to retain, such as sucrose and glucose, eluted during the cartridge wash step. Further analysis of concentrated rice extracts will be conducted and experiments designed to probe reproducibility will be performed.
The Influence of Maternal Depression on Parent-Child Interactions and the Adjustment of Pre-School Age Children

Kareen Sanchez, Psychology
Mentor: Tuppett Yates
Department of Psychology

Understanding the path by which maternal depression may influence child adjustment is important because children of depressed caregivers have more problems than children of non-depressed caregivers. The purpose of this study was to examine how individual differences in mothers’ mental health contribute to their observed parenting of their child during parent-child interactions and, ultimately, to children’s adjustment in preschool. Data were collected from 155 parent-child dyads who participated in a study of early child development at UCR. Maternal depression was assessed with the Symptom Checklist 90-R. Parenting quality was coded based on video-recorded parent-child interactions across four problem-solving tasks. Children’s behavior problems were measured using varied questionnaires across multiple informants, including the mother, the child examiner and the child’s preschool teacher. Consistent with previous research, depressed mothers described their children as having higher levels of behavior problems, but these relations were not apparent in teacher or examiner reports. During parent-child interactions, depressed mothers were observed to be less supportive and more hostile toward their child, and these parenting deficits were associated with increased child problems. These results show the importance of observational and multi-informant methods to understand the influence of maternal depression on early child adjustment.

Postmodern Poetry and the Stifled Woman: Female Subjectivity and Feminine Portrayal

April Sanders, English
Mentor: Steven Gould Axelrod
Department of English

In the works of Sylvia Plath, Frank Bidart, Wanda Coleman, and Harryette Mullen the subjectivity of the female speaker is one of subjugation. Within these postmodern poems oppression and defeat, marked by elements of limited language, inward and outward dissatisfaction, and artificiality all accentuate the female’s fragmented character. Through research regarding feminism, particularly theories inspired by Adrienne Rich within her poetry, I discuss the methods by which the poets show how the female in poetry is held back by her insecurity, society, silence, and her own sense of defeat. The theory of Makeover discourse is also integrated to show the postmodern state of the stifled female, as she is constantly in a state of being ‘made-over’ or attempting perfection. Post-humanism, an element of postmodernism, is then accomplished by the females portrayed throughout the analyzed poetry as they are all fashioned to fail due to the societal expectations of perfection, and it is only with alterations (‘make-overs’) that they are able to feel more cohesive, yet become more disjointed. Primarily in the works of Plath, Bidart, and Coleman the female character is given no other option but to complete her feminine perfection in death or psychosis, as her society does not accept her. Harryette Mullen however, projects a spirit in her female speaker; she utilizes sarcasm and semantic play to generate a language that is all her own and not that of the “oppressor.”
Two year survey of Glassy-Winged Sharpshooter visitation and Xylella fastidiosa infection rates in Southern California grapevines

Candice Sanscartier, Bioengineering
Mentors: Thomas A. Miller
Genet Tulgetske
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Across the United States from California to Florida and as far north as Virginia, grapevines are succumbing to Pierce’s Disease (PD) currently infecting more than 30% of America’s $30 billion wine industry. PD is caused by the bacterial pathogen, Xylella fastidiosa, which blocks water from flowing through plant xylem. Affected grapevines develop leaves that are discolored and dried out, and usually die within 2-5 years. The most effective vector of X. fastidiosa is the xylem feeding leafhopper, Glassy-Winged Sharpshooter (GWSS). GWSS are most commonly found in mild to scorching temperatures and are able to feed on the woody stems of plants which make it an optimal vector for the pathogen. In the summer, GWSS populations explode, creating the greatest period of X. fastidiosa infection in grapevines. We performed a survey on unsprayed grapevines on the UCR campus from late April to late October, 2011, to determine patterns of GWSS visiting the plants and their infection status. Insects were collected weekly on yellow sticky traps. All insects were surface sterilized, the bacterial DNA was extracted, and real-time PCR was used to test for X. fastidiosa. A total of 1005 GWSS were collected and analyzed for presence of X. fastidiosa. We will present the results of this survey and discuss the findings in the context of a previous survey conducted last summer. Also, we will discuss factors that may influence patterns seen during the entire 2 year GWSS visitation and infection frequency survey.

Analysis of NMR Data by Visual Interpretation of Z Score Matrices (VIZR) in R

Sumukh Sathnur, Chemistry
Mentor: Cindy Larive
Department of Chemistry

Pomegranate juice, due to its high antioxidant content, has been espoused as a dietary supplement with many benefits, making it a highly popular and lucrative business. As a result, there is economic motivation to market products that are less than 100% pomegranate juice. A novel statistical approach for identification of juice adulteration, termed VIZR, was developed to individually examine juice samples and determine authenticity. VIZR is written in R, a freely available open source statistics program. VIZR works by first analyzing an authenticated library of known pomegranate juice samples and then juice samples of unknown purity are queried against the library of authenticated samples. The NMR spectra of juice samples and references are exported as integrated binned files. The VIZR analysis generates matrices of Z scores for the samples queried against the in-house generated library of authenticated samples. These matrices were used to generate heatmaps to visually identify samples that vary from the library, identifying specific NMR resonances that deviate significantly from the reference spectra. By comparing total deviation in each sample matrix, a prioritized list of samples for examination can be generated. Furthermore, VIZR can generate plots indicating the spectral regions responsible for variation, compared with an average reference and sample spectrum. VIZR succeeded in detecting and identifying juice blends as low as 10%, as well as additives like propylene glycol and suspected food dyes. Possible future applications of VIZR may include detection of human disease biomarkers.
Commodification in the 19th Century Arcades: Dialectical Images, Gender, and Advertising

Brenna Schaaf, English, Sociology  
*Mentor:* Susan Zieger  
Department of English

With the advent of technology, the artistic esthetic became subdued due to the nature of rapidly morphing technology. This new space of commerce became the surrogate for social gatherings, controlling and dictating cultural identity. The arcades thus naturally became the new face of Parisian identity, promoting shared pleasures and identities, transforming the individual into a Parisian. Advertisements in the arcades underwent a massive evolution from the 18th century into the 19th century. As advertisements matured and grew in sophistication so did marketing strategies and their effectiveness. These new stimuli of communication offered direct messages to the masses of patrons in the arcades. The demise of the punctual or anchored classical observer began in the early 19th century, and became increasingly displaced by the unstable attentive subject. The source of this inattention can be attributed to key intermediate sets of variables such as overstimulation and the commodification of women. The whimsical and enchanting nature of the arcades created a dream world for patrons luring them into the narratives of these advertisements. The delirious dream like arcades gave life to comatose commodities lining the iron aisles so that the consumption of these products became vessels of transportation to a dreamed of world. Certain aspects 19th century consumption were overlooked. Walter Benjamin’s radical philosophy of the “dialectical image” can be better understood through advertising images. This paper attempts to further our understanding of advertising, consumption, and gender in the Arcades.

The Age of Augustus and His Image in Select Contemporary Art Literature

Alexandra Schneider  
Comparative Ancient Civilizations  
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Department of Comparative Literature and Foreign Languages

Following the civil wars of the Roman Republic that lasted from about 134 to 31 BC, the cultural and political nature of Rome underwent monumental change, especially after the rise in power of Octavian, who would eventually become Rome’s first emperor, Augustus. This paper examines the art and literature of the age that, as popular and elite works, served as media that created propagandized images of politicians, heroes, and gods. In the case of Augustus, the art and literature of the age helped justify his monarchical rule by appropriating imagery and stories of Roman foundation mythology and the main characters therein, effectively creating a new “mythology” that suggested Augustus as a predestined ruler and savior figure, similar to that of Rome’s original founder, Aeneas. This paper explores the historical context of the creation of this new “mythology,” the association suggested between Augustus and Aeneas, as well as the relevant role of Augustus’ patron god Apollo in both art and literature. This research also examines the reactions to Augustan propaganda by specifically focusing on the writer Ovid, whose writings have widely been seen as anti-Augustan, though this paper argues for a more complex relationship between the two men and the way they each chose to rework history and religion to their will. Within this paper, the major research is conducted by examining the Ara Pacis Augustae, monuments/temples of Apollo, Virgil’s Aeneid, and Ovid’s Metamorphosis.
**Elucidating the relationship between β-Catenin and Prickle 1 in the Wnt/PCP Pathway upon overexpression of miR-361**

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The search for molecular mechanisms of osteoblast differentiation remains a central challenge in understanding bone formation. Murine ESCs are an ideal model to study osteoblast differentiation. In vitro study of ESCs osteogenesis has revealed that bone originates from the mesoderm and ectoderm via neural crest formation. It has been also observed that transcriptional activity of β-catenin (CatnB) fluctuates during early mesoderm and neural crest formation; however, there is still little known about how CatnB executes the osteoblast-specific differentiation program. In this study, we aim to elucidate the relationship between CatnB and Prickle-1 which is a key protein involved in the Wnt/planar cell polarity (PCP) pathway. Our lab has identified that Prickle-1 is a direct target of a specific microRNA, miR-361, and therefore, we have used microRNA overexpression approaches to investigate if down-regulation of Prickle-1 could influence CatnB expression levels and its transcriptional activity. Indeed, the overexpression of miR-361 during differentiation resulted in a reduction of protein levels of Prickle-1. Furthermore, western blot analyses have shown that nuclear protein expression levels of Sox-1 and Sox-10, which are markers of neural crest cells, upon miRNA overexpression. RT-PCR analyses have revealed that in the presence of miR-361, mRNA levels of both genes are increased. In summary, our analyses have revealed that crosstalk between Wnt canonical and non-canonical pathways through CatnB and Prickle-1 can play a functional role in modulating osteogenic differentiation of ESCs.

**Mapping the Proliferation of Non-Governmental Organizations (NGOs)**

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The political and economic atmosphere of the 1980s and 1990s set the stage for non-governmental organizations (NGOs) to proliferate in developing countries. Two overarching themes for developing nations during this time involve government instability and rising poverty. The political and economic context as exemplified in Indonesia during the end of the Suharto regime captures an environment enabling private sector NGOs to flourish. Movement towards democratization and foreign donors influx of money comprise two fundamental elements enabling NGOs to burgeon. Various scholars have investigated multiple themes relating to NGOs during this period of extensive growth, and my research adds to these themes but through a case study of Indonesian NGOs. Specifically, I investigate the network between northern NGOs, donors, and the Indonesian government had on the organization of NGOs asserting that NGOs strategies and ability to effectively combat poverty in local communities were largely influenced by these other actors.

**The Effects of Different Genres of Background Music on Women’s Trait Inferences about Men**

Jasmine Singh  
Bowen Shaner  
Psychology  
*Mentor*: Larry Rosenblum  
Department of Psychology

It has been found that the presence of music can significantly have bearing on an individual’s emotional state, behavior and perception (May & Hamilton, 1980; Bryne & Clore, 1970). The
genre of music determines the type of behavior that ensues, with individuals normally acting in accordance with stereotypes about that particular genre, such as buying expensive wines when a sophisticated classical song is playing in a wine store (Areni & Kim, 1993). The current study sought to determine the effect of sophistication levels in music, between classical and popular genres, on women’s trait inferences about men. Participants judged the attractiveness, sociability, sophistication in literature and arts, approachability and socio-economic status of five male photographs in the presence of classical music, popular music, or silence. Results show that sophistication levels in background music did not affect women’s perceptions about men, but the women’s ratings of various traits were significantly related.

**Economic Consequences of the Welfare Reform of 1996: A Blessing or a Curse?**

Kevin Smith, Economics/Law and Society  
*Mentor:* Steven Helfand, Economics

Since the early 1990’s the United States has seen substantial change in the design and influence of its Social Assistance Programs (SAPs). SAPs refer to government funded aid provided to the poor as a type of social “safety net” to buffer against economic shocks and hazards. Welfare is one of the most important SAPs in the U.S. SAPs can successfully prevent spells of poverty due to unemployment during a recession, provide outlets for upward mobility out of poverty, and bolster health conditions of infants and children. In 1996 the United States undertook a dramatic change in both the structure and regulation of its SAPs. The reform had impacts on welfare participation, employment, income, poverty, family structure and immigration. Only by analyzing the social and economic impacts of these changes on a broad set of outcomes can we determine the complete impact of the 1996 Welfare Reform.

**Progressive Social Assistance in Brazil: The Evolution of Conditional Cash Transfers**

Kevin Smith, Economics/Law and Society  
Andrea Mendiola, Economics  
*Mentor:* Steven Helfand, Economics

Brazil’s exponential growth in Conditional Cash Transfer Programs (CCTs), resulting in over 26.4 million recipients, has made it the largest CCT program in the developing world. Conditional Cash Transfers are a type of social contract. They provide small monetary transfers to the poor contingent on investing in human capital. By providing transfers to the poor coupled with incentives to invest in human capital, the government is able to decrease poverty and inequality in the short run while increasing long run levels of health, education and output. Brazil’s progressive CCT programs have been successful in advancing Human Development and have evolved over time to more effectively accomplish their goals: investing in human capital to lower poverty and inequality.

**Childhood Conscientiousness, Dementia, and the Mediating Roles of Physical Activity**

Patra Sorod, Biochemistry  
*Mentor:* Howard Friedman  
Department of Psychology

Dementia is a collection of symptoms caused by a number of disorders which affect the brain; the most common is Alzheimer’s disease. The seventh leading cause of death in the United States, dementia affects more than five million Americans, including half the population above age 85 (Alzheimer’s Association, 2012). It is known that individuals who have healthier lifestyles not only have lower risk of dementia but also are those more self-motivated, dependable, and conscientious (Wilson et al., 2007). Further, individuals who are conscientious in childhood are far more likely to have beneficial health behaviors later in life (Friedman et al., 1993), but relations to dementia are unknown. This study investigated whether childhood conscientiousness predicts later life...
dementia. Midlife physical activity, associated with both conscientiousness and dementia (Jedriewski et al., 2010), is tested as a mediating factor in this relationship. Seven variables from five surveys of the Terman longitudinal study of 1500 gifted individuals were used to identify demented individuals, after age 65. These variables include: dementia mentioned in death certificates and obituaries, major deterioration in well-being, ceasing of activities, troubles and hassles, misplaced or lost things due to poor memory, and personal property and financial management. The results of this study indicate possible new biopsychosocial pathways to dementia versus healthy aging.

**Effects of Dietary Phytoestrogens On Paternal Responsiveness And Maturation In The Biparental California Mouse**

Aaron Stamp, Bioengineering
Trey Amador, Biology
*Mentor:* Wendy Saltzman
Department of Biology
*Contributors:* Breanna Harris, Juan Pablo Perez-Rodriguez, Department of Biology

The California mouse (*Peromyscus californicus*) is a monogamous, biparental rodent in which fathers show strong attraction to pups while virgin males show variable paternal responsiveness. Previous studies have demonstrated that circulating testosterone enhances paternal behavior in this species via aromatization to estrogen. We tested the hypothesis that paternal responsiveness in virgin males would likewise be enhanced by dietary estrogens (i.e., phytoestrogens, PE) from soy. Virgin males (N=16 per group) were fed commercially available diets containing high, intermediate, or low levels of PE, from the time of weaning until sacrifice in early adulthood, and behavioral responses to an unfamiliar pup, body mass, testis masses, fat-pad masses, and epididymal sperm counts were compared among the three groups. No differences were found in males’ behavioral responses to a pup. Similarly, testis masses, fat-pad masses, and sperm counts did not differ as a function of dietary PE content. However, patterns of body mass over time differed significantly among groups (P<0.001), as mice on the high-PE diet gained more mass across the study than those on a low-PE diet (P<0.001); neither of these groups differed significantly from the intermediate-PE group. These results suggest that the levels of phytoestrogens in the three diets used in this study differentially affect patterns of physical growth but not paternal behavior, fat deposition, testicular development, or spermatogenesis.

**A Literature Review on Sex Workers in China: the Exploitation of Women by the CCP**

Jessica Tjiu, Political Science, International Affairs and Asian Comparative Literature
*Mentor:* Amalia Cabezas
Department of Women’s Studies

In my literature review, I researched about the consequences that Chinese sex workers experience due to the Chinese Communist Party’s (CCP) anti-prostitution laws and policies. I read articles and books about HIV/AIDS transmissions, working conditions, and police corruption to understand the interactions between the CCP government and Chinese sex workers. Then, I realized that they are vulnerable to violence, rape, and sexual transmitted diseases since they neither ask for protection from the police nor go to the health clinics in fear of prosecution and stigmatization. However, the Chinese government receives economic benefits from the sex workers, exploiting them. In the middle of my research, I got interested in finding solutions to decrease their vulnerability and hardship, focusing on the roles of non-governmental organizations (NGOs) in China. Due to the complicated procedures of starting a NGO in China, I believed there might be better solutions. It is imperative to research more on realistic solutions that the CCP government can implement in order to help vulnerable women from abuse, violence, and isolation.
Ureteral stents are used to facilitate passage of urine through the ureter that may be blocked by obstructions, such as kidney stones or tumors. Currently used polyurethane-based ureteral stents often cause clinical complications (e.g. bacterial infection, encrustation, etc.) and require removal procedures. Among the various types of bacteria, *Escherichia Coli* is the most prevalent bacteria resulting in urinary tract infections, which affect approximately 10-50% of patients with ureteral stents. Encrustation on ureteral stents over time could cause tears in the ureter and urethra upon removal, pain to the patient and blockage of urine while still implanted. Previous studies have shown that pure magnesium inhibited bacterial growth as compared with a commercially-available and FDA approved polyurethane stent. Therefore, magnesium is promising as a novel ureteral stent biomaterial. Not only is magnesium innate in the human body, but it also degrades naturally in the body and thus eliminates the need for painful removal procedures and associated cost. The objective of this study was to analyze the degradation property of magnesium alloys (e.g. oxidized and polished magnesium-yttrium alloys, magnesium-aluminum-zinc alloy, and pure magnesium) when immersed in an artificial urine solution for prescribed periods. Through these studies, we found that both oxidized and polished magnesium-yttrium alloys degraded at a faster rate as compared to magnesium-aluminum-zinc alloy and pure magnesium. Further bacterial studies will allow us to determine antimicrobial properties of these alloys to improve effectiveness and safety of magnesium-based biodegradable ureteral stents.

**Formation of an Intrastrand Crosslink from the UVB Irradiation of Dickerson Dodecamer DNA Containing 5-Bromo-2’-deoxycytidine**

Audrey Tu, Biochemistry
Yinsheng Wang, Chemistry

Abstract available at Friday Poster Presentation

**The Creative Impact of Love and Friendship**

Chelsea Erika Velma Usher, English
*Mentors:* George Haggerty
Benjamin King

In the early 19th Century, the second wave of British Romanticism had begun to take form through the poet Percy Bysshe Shelley. He was an avid fan and critical analyst of the first generation Romantic authors, and used their literary traditions to form and mold his own creative works. I argue in my thesis that his works and impact on the literary canon relied heavily on the close and intimate relationship he had with his wife, Mary Shelley. Mary Shelley, too, had many critically important pieces, with *Frankenstein* being, arguably, her best. I believe that her work (as with Shelley’s poetry) was dependent upon Shelley’s own musings and confidence in his wife’s creative ability. Through research and critical analysis of literary texts, I thoroughly argue that both had a critically influential hand in the other’s works. The nature of their relationship impacted both very heavily, creating unparalleled works for the literary canon. I complete close readings on key texts from both authors in order to analyze the similarities in the texts, and how their lives and travels together helped to create their masterpieces.
Duplicities within the Urban Space reflected in Male Pathology

Amber Valles, English  
Mentor: Susan Zieger  
Department of English

The advent of modernity engulfed the individual in a rapid development of urbanization, mass production/consumption, capitalism, secularism, and new modes of thinking. Suddenly, man was disconnected from nature and his agrarian roots and integrated in a fabricated world of spectacle, entertainment and materialism. In the urban space, the human race existed as a divided community by individual competition and class structure. Consequently, in this displacement from rural to urban, man became subject to uncontrollable forces that divided his nature. Robert Stevenson’s novel, The Strange Case of Dr. Jekyll and Mr. Hyde, illustrates man within the transience of urban modernity, presenting a strange case of individual duplicity that accents the binaries in man, which in turn reflects the dichotomies of the urban space. This binary gap alludes to the “polar twins” identified by Dr. Jekyll, good and evil, which became more distinct within the psyche as the individual strove for prominence within a perpetually transient world. In Stevenson’s novel, this compound nature of man manifests due to the struggle between repressed desires/passions and the maintenance of prestige in one’s reputation. Through the contrasts of Dr. Jekyll, a proper Victorian bourgeois, and Mr. Hyde, a degenerate figure, Stevenson illustrates the existing duplicity in human nature that is accentuated and tested by forces of modernity such as wealth, class, and the multitudes. In order to exhibit this dual nature, one must deconstruct and analyze the multifarious, pathological desires of these masculine figures, within the sinuous labyrinth of the metropolis—considering man as a malleable figure of the urban complex.

Bringing Eastside Youth to UCR: Opportunity through College Exposure

Jose Verdin, History  
Mentor: Tanya Nieri  
Department of Sociology

This research examined the effect of an intervention designed to increase college opportunity among youths residing in Riverside’s Eastside neighborhood through exposure to UCR. The 15-week intervention brings youth to visit UCR and connect with university students, provides information on applying to college and on the college experience, and has the participants envision themselves as part of the university. It aims to develop the perspective that college is a viable option for them. The 5 participants are Latino males, aged 15 to 20 years, all with gang exposure. Four are currently in school, one is not. Facilitators include 3 male and 4 female UCR students, all of whom are members of Brown Issues, a student organization. Participants complete pre- and post-test surveys with questions on their knowledge of and aspirations for college, risk and protective factors, and demographics. Other data include intervention attendance and fieldnotes on lessons learned with regard to recruitment, retention, and implementation and on the content and impact of session discussions. Results indicate that the program provides participants with a safe space for discussing personal struggles and achievements in their neighborhoods, serves as a prosocial activity that is an alternative to negative behaviors. Reports from participants reflect a greater interest in education in general and college in particular, greater hope for realizing this interest, and greater understanding about not just practical matters but also the deeper personal and community struggles of identity and commitment associated with getting into and succeeding in college.
Emoticons: Mean More Than :)  

Jason Viray, Psychology and Sociology  
*Mentor:* Curt Burgess  
Department of Psychology  

We use devices, such as phones and computers, to interact with others and this new kind of dialect has created a language of its own. An example of this is the emergence of symbols and characters portraying emotions such as “:))” known as emoticons. The use of emoticons is important to study because it can tell us how people use emotional connotation in language that does not contain the richness of spoken language. The research by Yuki, Maddux, and Masuda (2007) has shown that Asians use and perceive emoticons differently, for example, they use these characters “(^_^)” to represent a smile rather than “:))”. The authors concluded that Asians tend to focus on the eyes to determine emotion and further research done by Cha (2007) suggests that they use more complex emoticons to signify their intimate relationships. This study was designed to investigate a broader range of sensory connotation by comparing the frequency of use of emoticons and to explore the semantic relationship of words that are related to the emoticons. Words that were shared in Asian and Hispanic corpora that potentially indicated sensory information (beyond the visual investigated by Yuki, et al.) were used (visual, kinesthetic, affective, auditory). A computational model of meaning (HAL) that learns word-word and word symbol relationships was used to compute the distances between sensory words and emoticons. The results of the usage frequency of these words and emoticons and the semantic distance analysis are reported and provides a broader context for the earlier research.

Capillary Electrophoresis as a Tool for Monitoring the Nature of Protein-Nanoparticle Conjugation  

Jimmy Vo, Biology  
*Mentor:* Wenwan Zhong  
Department of Chemistry  

Nanoparticles are a rapidly growing field in the scientific community. Due to their unique physical properties, various nanoparticles have found use in drug delivery, imaging or protein detection. In these applications, conjugation of protein to particle is needed for proper targeting. One of the problems, however, is in designing a conjugation protocol that leaves the protein active for further studies. Capillary electrophoresis was used to observe mobility shifts of iron oxide nanoparticles after conjugation to Immunoglobulin G (IgG), and in optimization of a conjugation scheme. In addition, successfully conjugated particles were then incubated in anti-IgG to determine if the IgG was properly oriented for other applications. It was concluded that, post-conjugation, interaction between the antibody and antigen was observed. Through this, it can be determined that the IgG remains active after conjugation, and this platform can be applied to determining the conjugation efficiency of active protein on the surface of a nanoparticle.

The “Quick Fix Philosophy” of Welfare Reform: Cost Concerns Versus the Importance of Education  

Brandon Walker  
Public Policy  
*Mentor:* Steven Helfand  
Department of Economics  

The Welfare Reform Bill of 1996 was the result of strategic planning by President Clinton and Congress in an effort to revamp the welfare system and the public’s perception of welfare recipients. The reform involved time limits and work requirements for recipients to receive benefits. The goal of the reform, which was to get welfare recipients participating in the
workforce, lacked critical components such as making sure that job opportunities existed before the requirements were set in place, supporting those transition out of welfare, and promoting the importance of education. The paper analyzes the role that case managers and welfare office culture played in shaping recipients’ perceptions of the value and importance of education, and it explores barriers that hindered the success of welfare mothers such as: education, number of dependents, and racial identity; all of which created considerable variation in success rates. The research suggests that education plays a key role in facilitating self-reliance and upward economic mobility, and that case workers often worked against those wishing to pursue education as a tool to reach their goals.

**Misconceptions and Realities of Poverty in Japan**

Christine Wong  
Economics/Administrative Studies  
*Mentor:* Steven Helfand  
Department of Economics

In the past few decades, Japan has faced a high rate of poverty that is in stark contrast to its postwar reputation as a highly egalitarian society. Many different causes have been attributed to the rise in poverty, but current solutions have done little to relieve the amount of poverty in Japan. The purpose of this research was to examine the causes of poverty in Japan, the problems with current policies, the differences between perception and reality, and as a result, discover better methods to address the problem. A critical review of the literature rejects certain factors that the media and even some scholars believe are the cause of poverty, such as the aging population, and supports other factors such as labor market dualism. It was also found that a misconception of what type of social policies the public needs and wants contributes to the growing problem. The data that was compiled lead to the conclusion that if these misconceptions are addressed, policies can be changed to better address the growing problem of poverty in Japan.

**More than Just A Name**

Joanna Wong, Psychology/Law and Society  
*Mentor:* Curt Burgess  
Department of Psychology

An analysis of the semantic and cognitive effects of proper names was undertaken using a computational model of memory- the Hal model. The model learns word relationships and can compute a semantic distance between words that corresponds to memory retrieval time. Earlier research has shown that the HAL model successfully predicted proper names (i.e. Semantic) constraints in syntactic processing (Burgess, Livesay & Lund, 1996) and demonstrated why proper names can be difficult to remember especially for the elderly (Burgess & Conley, 1999). In this study, a set of proper names were taken from a compilation of text from Asian American bloggers (approximately a half million words from Live Journal blogs). In order to determine if proper names are semantically related to personality traits and if proper names can be associated with either positive or negative emotions. Since high frequency words may have more ambiguous meanings, the context in which they were used was checked in the corpus and controlled such that only relevant meaning contexts were used. The results from this study prove insights into how stereotypes are represented in memory. The results also bear on the issue of whether emotional connotation can be learned from the statistical regularities in language.
**Analyzing for 3-O-Methyl-Rhamnosyl Residues in Targeted Knock-Out Lines of Physcomitrella patens**

Thinn Zaw  
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Mosses are among the most primitive plants, and their cell walls might be considered simpler models for study than those of more derived plants. Plants cell walls are mostly composed of carbohydrate-rich polymers. One such polymer, arabinogalactan protein (AGP), in the moss *Physcomitrella patens* is the focus of this study. Moss AGPs are generally similar to higher plant AGPs but contain about 15 mol% of 3-O-methyl-rhamnose (3-O-Me-Rha), an unusual sugar not found in angiosperm polymers. The goal of this project is to identify the gene encoding the methyltransferase that adds a methyl group to Rha to produce 3-O-Me-Rha. This project compared wild-type and mutant moss lines in which candidate methyltransferase genes, selected on the basis of similarity to a *Mycobacterium* methyltransferase, were knocked-out, or disabled. The hypothesis is that if the gene encoding a rhamnosyl-3-O-methyltransferase enzyme has been knocked out, then AGPs purified from that culture line should contain no, or a reduced level of, 3-O-Me-Rha in comparison to the wild-type. Moss cultures were homogenized, and the resulting AGP-enriched fraction was analyzed via gas chromatography to determine its carbohydrate composition. Several knock-out culture lines were examined, and some, but not all, of these lines appeared to have reduced levels of 3-O-Me-L-Rha in their AGP fraction. Those culture lines with reduced levels of 3-O-Me-L-Rha are worthy of further study. This project is supported by the National Research Initiative competitive grant no. 2008-35318-04599 from the USDA National Institute of Food and Agriculture.
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