May 8, 2009

Dear Colleagues and Guests,

Nurturing intellectual curiosity and supporting the creation of new knowledge is 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 scholarly work of our students 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 required of students participating in this symposium. To prepare our students for their next steps beyond graduation from UCR, we must offer them encouragement and the opportunity for academic exploration beyond the classroom. This symposium illustrates how the academic culture at UCR 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
May 8, 2009

Welcome to the Third Annual Symposium for Undergraduate Research, Scholarship, and Creative Activity.

The creative process can be a lonely one. The researcher toils away, often 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 toils 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,

David H. Fairris
Vice Provost for Undergraduate Education
Professor of Economics
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Welcome from Undergraduate Education  
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Acknowledgements

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.
Schedule of Events

Friday, May 8, 2009
Highlander Union Building (formerly Commons)

8:00am – 2:30pm  Registration for Participants
Room 302 South

8:00am – 9:00am  Continental Breakfast and Undergraduate Opportunity Faire
UCR undergraduate research, scholarship and creative activity program representatives will be available with information about future opportunities
Room 302 South, HUB

9:00am – 12:00 noon  Oral Presentations
Room 260, HUB
CHASS Sessions A, C, E
Three presentations are scheduled in each session

Room 268, HUB
CNAS & BCOE Sessions B, D, F
Three presentations are scheduled in each session

12:00 noon - 1:00pm  Poster Presentations
Room 302 South, HUB

1:00pm – 4:40pm  Oral Presentations
Room 260, HUB
CHASS Sessions G, I, K, M
Three presentations are scheduled in each session

Room 268, HUB
CNAS & BCOE Sessions H, J
CHASS Session L
Three presentations are scheduled in each session
**Oral Presentation Sessions**

Each oral presentation is allocated 15 minutes, including 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.

**Oral Presentation Session A - Room 260, HUB - 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>Jane Arney</td>
<td>Winged Goddesses: Liminality and Gender in the Ancient World</td>
<td>Kristoffer Neville, Department of Art History</td>
</tr>
<tr>
<td>Art History</td>
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</tr>
<tr>
<td>Alaa Milbes</td>
<td>The Genesis of the Party of God: the development of Hezbolah in Lebanon</td>
<td>Juliann Allison, Department of Political Science</td>
</tr>
<tr>
<td>Political Science/ International Relations</td>
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<tr>
<td>Curtis Miller</td>
<td>Bombing Hills, or The Follow Through</td>
<td>Kate Anger, Department of Theatre</td>
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**Oral Presentation Session B - Room 268, HUB - 9:00am - 10:00am**

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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>Farouk Bruce</td>
<td>Site Specific Conjugation of Ketone Containing Peptides onto Glass</td>
<td>Jiayu Liao, Department of Bioengineering</td>
</tr>
<tr>
<td>Bioengineering</td>
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<tr>
<td>Jared Dodson</td>
<td>The Role of Electrostatics in the Function of Factor H, and its Relation to Complement System Mediated Disease</td>
<td>Dimitrios Morikis, Department of Bioengineering</td>
</tr>
<tr>
<td>Bioengineering</td>
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<tr>
<td>Meng Wang</td>
<td>Distributed Power Generator Dispersion Simulation in a Water Channel</td>
<td>Marko Princevac, Department of Mechanical Engineering</td>
</tr>
<tr>
<td>Bioengineering</td>
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<td>Homero Vazquez</td>
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<td>Bioengineering</td>
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<tr>
<td>Manuel Michel</td>
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<tr>
<td>Mechanical Engineering</td>
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### Oral Presentation Session C - Room 260, HUB - 10:00am - 11:00am

<table>
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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>Shady Grove Oliver</td>
<td>Spontaneous Shrines: Dealing with the Pain of Loss on the Roadside and the Internet</td>
<td>Vivian-Lee Nyitray Department of Religious Studies</td>
</tr>
<tr>
<td>Foreign Languages/ Religious Studies</td>
<td></td>
<td>Theda Shapiro Department of Comparative Literature</td>
</tr>
<tr>
<td>Shawn Higgins</td>
<td>Materialism, Memory, and Self-Expression: Success in Caribbean-American Literature</td>
<td>Erica Edwards Department of English</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td>Emory Elliot Department of English</td>
</tr>
<tr>
<td>Shannon Hervey</td>
<td>Doubt and Suspicion in Nouns: Gertrude Stein and the Creative Process</td>
<td>Katherine Kinney Department of English</td>
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</tbody>
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### Oral Presentation Session D - Room 268, HUB - 10:00pm - 11:00am

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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>Monica Galaviz</td>
<td>Four hundred and twenty-five million year old squashed jellyfish from Iowa</td>
<td>Nigel Hughes Department of Earth Sciences</td>
</tr>
<tr>
<td>Geology</td>
<td></td>
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</tr>
<tr>
<td>Chuong Vu</td>
<td>Investigating Lemon Ancestry Using Microsatellite Markers</td>
<td>Mikeal Roose Department of Botany and Plant Sciences</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nolan Ung</td>
<td>Signaling in the Shot Apical Meristem of Arabidopsis</td>
<td>Harley Smith Department of Botany and Plant Sciences</td>
</tr>
<tr>
<td>Botany and Plant Sciences</td>
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</table>
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### Oral Presentation Session E - Room 260, HUB - 11:00am - 12:00pm

<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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<tbody>
<tr>
<td>Elizabeth Bingle</td>
<td>Warehouse Workers United: Resisting Multiple Oppressions Among Warehouse Workers in the Inland Empire</td>
<td>Ellen Reese Department of Sociology</td>
</tr>
<tr>
<td>Johnnyra Esparza</td>
<td>Sociology and Chicana/o Studies</td>
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</tr>
<tr>
<td>Raquel Madrigal</td>
<td>Invisible Scholars and the Plight of the Undocumented Struggle for Citizenship</td>
<td>Jennifer Najera Department of Ethnic Studies</td>
</tr>
<tr>
<td>Lauren Menor</td>
<td>Healthy Discussion: The Effect of Deliberation on the Advancement of Knowledge</td>
<td>Kevin Esterling Department of Political Science</td>
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</table>

### Oral Presentation Session F - Room 268, HUB - 11:00am - 12:00pm

<table>
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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>Tung Tran</td>
<td>Enhancement of Sperm Activation by Cholesterol Efflux in Caenorhabditis elegans</td>
<td>Richard Cardullo Department of Biology</td>
</tr>
<tr>
<td>Andrew Habashy</td>
<td>The Role of CCR7 and its ligands, CCL19 and CCL21, in the immune response to Toxoplasma gondii infections</td>
<td>Emma Wilson Division of Biomedical Sciences</td>
</tr>
<tr>
<td>Michael Panowicz</td>
<td>β5γ3 and ATM interaction in relation to the p53 tumor suppressor protein</td>
<td>Xuan Liu Department of Biochemistry</td>
</tr>
</tbody>
</table>
## Poster Presentation Session

During the 60-minute poster session, all student presenters stand by their poster displays and are available to discuss their projects and answer questions.

Set-up begins at 11:30am, **Time: 12:00 pm – 1:00 pm**
**Room 302 South, HUB**

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Presenter/Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>Christine Kwong Business Economics</td>
<td>The Effects of Going Green in Corporate America</td>
<td>Victor Lippit Department of Economics Stephanie Hammer Department of Comparative Literature and Foreign Languages</td>
</tr>
<tr>
<td># 2</td>
<td>Ashley Cacho Applied Mathematics in Statistics</td>
<td>A Regional ANOCOVA Modeling Approach for Calibrating EM Survey Data</td>
<td>Daniel Jeske Department of Statistics Scott Lesch Statistical Consulting Collaboratory</td>
</tr>
<tr>
<td># 3</td>
<td>Tyler Colyer Environmental Engineering</td>
<td>Size-dependent Adsorption of Natural Organic Matter onto Nanoscale Iron Oxides</td>
<td>David Cwiertny Department of Chemical and Environmental Engineering</td>
</tr>
<tr>
<td># 4</td>
<td>Manjot Singh Mechanical Engineering</td>
<td>Preliminary Study on Preheating Kinetics</td>
<td>Bin Yang CE-CERT</td>
</tr>
<tr>
<td># 5</td>
<td>Manjot Singh Mechanical Engineering</td>
<td>Repair and Modification to the Steam Gun</td>
<td>Bin Yang CE-CERT</td>
</tr>
<tr>
<td># 6</td>
<td>Ramon Joshua Garong Chemical Engineering</td>
<td>Electrochemical methods for studying pollutant removal by iron-based bimetallic reductants</td>
<td>David Cwiertny Department of Chemical and Environmental Engineering</td>
</tr>
<tr>
<td># 7</td>
<td>Bryan Goldsmith Chemical Engineering</td>
<td>Electrochemical Synthesis and Characterization of Ni80Fe20/Cu Multilayered Nanowires</td>
<td>Nosang Myung Department of Chemical Engineering</td>
</tr>
<tr>
<td># 8</td>
<td>Hisham Abukamleh Biochemistry</td>
<td>The army within the plant: Identifying tomato genes involved in Mi-1-mediated defense</td>
<td>Isgouhi Kaloshian Department of Nematology</td>
</tr>
<tr>
<td># 9</td>
<td>Brian Langloss Chemistry</td>
<td>Metal-Ligand Cage Complexes As Enzyme Mimics</td>
<td>Richard Hooley Department of Chemistry</td>
</tr>
</tbody>
</table>
### Poster Presentation Session

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<tbody>
<tr>
<td># 10</td>
<td>Carlo Mejia</td>
<td>Segmental differences in Colonic Transporter Expression</td>
<td>Christian Lytle Division of Biomedical Sciences</td>
</tr>
<tr>
<td># 11</td>
<td>Prince Sasis</td>
<td>RBR Gene Regulates Stem Cell Maintenance In Arabidopsis Shoot Apical Meristem</td>
<td>Venugopala Reddy Gonehal Department of Botany and Plant Sciences</td>
</tr>
<tr>
<td># 12</td>
<td>Helen Gantenbein</td>
<td>Cancer and Liminality: The Roles of Hope and Fear</td>
<td>Juliet McMullin Department of Anthropology</td>
</tr>
<tr>
<td># 13</td>
<td>Carrell Jamilano</td>
<td>Facing the Inevitable: Predictors of Two Types of Acceptance</td>
<td>Kate Sweeney Department of Psychology</td>
</tr>
<tr>
<td># 14</td>
<td>Erica Morales</td>
<td>Concurrent Relations Between Preschool Personality Profiles and Socio-emotional Adaptation</td>
<td>Tuppett Yates Department of Psychology</td>
</tr>
<tr>
<td># 15</td>
<td>Arthur Unzueta</td>
<td>Beyond Entertainment: The Translation of Media Standards and Social Inequality on the Female Conscious</td>
<td>Tuppett Yates Department of Psychology</td>
</tr>
<tr>
<td># 16</td>
<td>Robert Martinez</td>
<td>Individual Differences in Social, Political, and Racial Attitudes Associated with Voting Behavior in the 2008 Presidential Election</td>
<td>Carolyn B. Murray Department of Psychology</td>
</tr>
<tr>
<td># 17</td>
<td>José Villalobos</td>
<td>Fascism in the 21st century: Do authoritarian ideologies still predict racism?</td>
<td>Carolyn B. Murray Department of Psychology</td>
</tr>
</tbody>
</table>
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**Oral Presentation Session G - Room 260, HUB - 1:00pm - 2:00pm**

<table>
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<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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</thead>
<tbody>
<tr>
<td>Salim Mhunzi</td>
<td>The Cultural and Geographic Factors of Student Mobility</td>
<td>Robert Hanneman, Department of Sociology</td>
</tr>
<tr>
<td>Danielle Chodak</td>
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<tr>
<td>Brenda Tedder</td>
<td>Body Image, Eating Disorders, and Capitalism</td>
<td>Tracy Fisher, Department of Women's Studies</td>
</tr>
<tr>
<td>Valerie Nolte</td>
<td>Parent-Child Separation: The moderating role of parental support</td>
<td>Tuppett Yates, Department of Psychology</td>
</tr>
</tbody>
</table>

**Oral Presentation Session H - Room 268, HUB - 1:00pm - 2:00pm**

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<th>Presenter(s)/ Major</th>
<th>Project Title</th>
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<tbody>
<tr>
<td>Muhammedzuned Desai</td>
<td>Electrostatic Properties of Decay-Accelerating Factor (DAF)</td>
<td>Dimitrios Morikis, Department of Bioengineering</td>
</tr>
<tr>
<td>Bioengineering</td>
<td></td>
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<tr>
<td>Alexander Dupuy</td>
<td>Densification and Characterization of Nanocrystalline Titania</td>
<td>Javier Garay, Department of Mechanical Engineering</td>
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<tr>
<td>Mechanical Engineering</td>
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<tr>
<td>Christian Bartolome</td>
<td>Laboratory, Field, and Numerical Modeling of Vehicular Emissions in Los Angeles and Huntington Beach</td>
<td>Marko Princevac, Department of Mechanical Engineering</td>
</tr>
</tbody>
</table>
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### Oral Presentation Session I - Room 260, HUB - 2:00pm - 3:00pm

<table>
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<th>Presenter(s)/ Major</th>
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<th>Faculty Mentor(s)/ Department</th>
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</thead>
</table>
| Shruti Dasgupta     | Relationship between Educational Media and Language/Cognition Levels in Infants and Toddlers | Rebekah Richert  
Department of Psychology |
| Samantha Wilson     | The Child Leader Project: From Idea to INGO in 365 Days | Anne Sutherland  
Susan Ossman  
Department of Anthropology/  
Global Studies |
| Shady Grove Oliver  | Capturing the Pain: The Ethics of War, Conflict, and Crisis Photojournalism | June O'Connor  
Department of Religious Studies  
Georg Michels  
Department of History  
D. Charles Whitney  
Department of Creative Writing/Media and Cultural Studies |

### Oral Presentation Session J - Room 268, HUB - 2:00pm - 3:00pm

<table>
<thead>
<tr>
<th>Presenter(s)/ Major</th>
<th>Project Title</th>
<th>Faculty Mentor(s)/ Department</th>
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| Theodore Tak Kit Yau| Relationship between sexually selected traits and compensatory traits: a study in Xiphophorus (swordtail and platy fish) | Christopher Oufiero  
David Reznick  
Department of Biology |
| Erica Tate          | 2-Ethylpyridine, Pyrazine, and Nicotine Chemicals in Cigarette Smoke, Affect Attachment and Proliferation of Mouse Embryonic Stem Cells | Prue Talbot  
Department of Cell Biology and Neuroscience |
| Danielle Wickman    | The repeatability of organ mass measurements after preservation in 5% formalin | David Reznick  
Theodore Garland  
Department of Biology |
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### Oral Presentation Session K - Room 260, HUB - 3:00pm - 4:00pm

<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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<tbody>
<tr>
<td>Lindsay McDowell, Political Science/History</td>
<td>Hiroshima: Propaganda and the Necessity of the Bomb</td>
<td>Juliann Allison, David Pion-Berlin, Department of Political Science</td>
</tr>
<tr>
<td>Alyssa Horton, Psychology</td>
<td>Notable Problems with Self-Esteem with Distrustful, Gullible People</td>
<td>Curt Burgess, Department of Psychology</td>
</tr>
<tr>
<td>Jennifer Orlando, Psychology</td>
<td>Effects of Traditional Religious Beliefs and Personal Gullibility on Happiness</td>
<td>Curt Burgess, Department of Psychology</td>
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### Oral Presentation Session L - Room 268, HUB - 3:00pm - 4:00pm

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<tbody>
<tr>
<td>Shahab Malik, Anthropology</td>
<td>Creating Culture: Religious Identity of Muslims in Southern California</td>
<td>Susan Ossman, Department of Anthropology, Global Studies, Reza Aslan, Department of Creative Writing, Muhamad Ali, Department of Religious Studies</td>
</tr>
<tr>
<td>Ana Baker, Comparative Literature</td>
<td>Experimenting with Autobiography</td>
<td>Michelle Bloom, Department of Comparative Literature and Foreign Languages</td>
</tr>
<tr>
<td>Yvette Luevano, Creative Writing</td>
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<tr>
<td>Maria Arellano, Psychology and French Language and Literature</td>
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Oral Presentation Sessions

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Oral Presentation Session M - Room 260, HUB - 4:00pm - 4:40pm

<table>
<thead>
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<th>Presenter(s)/ Major</th>
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<tbody>
<tr>
<td>Ana Kamille Marcelo</td>
<td>The Developmental Significance of Emotion Expression in Preschoolers’ Play</td>
<td>Tuppett Yates Department of Psychology</td>
</tr>
<tr>
<td>Psychology/Law and Society</td>
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<tr>
<td>Anwar Hijaz</td>
<td>Role of Women in Conflict: The Case of Palestinian and Israeli Women</td>
<td>Juliann Allison Department of Political Science</td>
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<tr>
<td>Political Science</td>
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<td>William Barndt Department of Political Science</td>
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<tr>
<td>Manar Hijaz</td>
<td>The Ethnic Cleansing of Palestine</td>
<td>Juliann Allison Department of Political Science</td>
</tr>
<tr>
<td>Political Science</td>
<td></td>
<td>William Barndt Department of Political Science</td>
</tr>
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</table>
Abstracts

The Army Within the Plant: Identifying Tomato Genes Involved in Mi-1-Mediated Defense

Hisham Abukamleh, Biochemistry
*Mentors*: Olivia Desmond and Isgouhi Kaloshian
Department of Nematology

In plants, resistance (R) gene-mediated defense confers resistance to a specific pest or pathogen following recognition of their avirulence (Avr) effectors. R-Avr mediated resistance is often conferred by a hypersensitive response that results in localized cell death at the infection site which starves the pathogen or pest. Mi-1 is a tomato R gene that confers resistance to root-knot nematodes, potato aphids and whiteflies. The signaling pathways involved during Mi-1-mediated resistance are not fully understood. We have developed a high-throughput assay based on virus-induced gene silencing (VIGS) to identify genes essential for Mi-1-mediated resistance. VIGS is a plant defense mechanism, where viral double-stranded RNA (dsRNA) is recognized by plant defense machinery and degraded into small-interfering RNA (siRNA). If a virus vector carries a plant gene, it also produces dsRNA and siRNA for that gene, leading to degradation of the endogenous RNA transcripts of that gene. This disables the function of that gene and we can determine if it has a role in Mi-1-mediated defenses by inducing HR on silenced leaves. We have used the Tobacco rattle virus (TRV) combined with a plant cDNA library, derived from pathogen induced tissue, to silence genes in *Nicotiana benthamiana* followed by infiltration with a spontaneous HR inducing variant of the Mi-1 gene. We observed attenuated HR in several silenced plants, indicating that the silenced genes play a role in the Mi-1-mediated HR.

Winged Goddesses: Liminality and Gender in the Ancient World

Jane Arney, Art History
*Mentor*: Kristoffer Neville
Department of Art History

The Greeks appropriated the iconography of wingedness from deities in Egypt and the Near East during the Archaic era, along with a wide array of other Orientalizing motifs. The symbolism of wings has been characterized as signifying protection, transport, or simply as decoration. However, by using a contextual approach as an interpretive framework, including the religious, literary and archaeological evidence, this study reveals that the iconography of wingedness is a visual code that signals the liminality of a deity. Moreover, in Mesopotamia and Egypt, this symbol was used primarily with important female deities, such as Ishtar and Isis, who were associated with the liminal area between death and resurrection. In Greece, however, when an eastern winged deity, such as Artemis, was adopted from the east, the wings were removed to Hellenize and tame her. By the Classical era the association with liminality was mainly restricted to male winged deities in the Greek pantheon, such as Hermes. Winged female deities were relatively minor goddesses, such as Nike and Iris, whose liminal functions were reduced to mediation between gods and men and were no longer concerned with death and resurrection. The Greeks modified the visual code of wingedness over time so that the iconography, which had been the symbol for powerful female deities who played important roles in the mythology of death and resurrection, was now used in a liminal sense only on masculine deities.
Experimenting with Autobiography

Anna Baker, Comparative Literature
Yvette Luevano, Creative Writing
Maria Arellano, Psychology and French Language and Literature
Mentor: Michelle Bloom
Department of

According to Philippe Lejeune the autobiography is defined as “retrospective prose narrative written by a real person concerning his own experience, where the focus is his individual life, in particular the story of his personality.” While many texts adhere to the autobiographical pact, there are notable exceptions within the genre in which the author manipulates the narrative to such an extreme that they can no longer be put in the same category as the traditional first person narrative. Autobiography is a relatively new and ever-changing genre. It becomes harder to determine the relationship between autobiography, fiction and autobiographical fiction in such ambiguous works that incorporate elements of different genres in themselves. Such narratives are subversive within the genre of autobiography. This presentation will examine some of the most experimental variations of autobiography to date and the continuing evolution of the genre.

Laboratory, Field, and Numerical Modeling of Vehicular Emissions in Los Angeles and Huntington Beach

Christian Bartolome, Mechanical Engineering
Contributors: Rufus Edwards, Anahita Sfazl, Jun Wu, Marlon Boarnet, Raul Lejano
University of California, Irvine
Mentors: Pan Hansheng, Marko Princevac
Department of Mechanical Engineering

The health risk presented by the exposure to traffic emissions in urban environments is great concern to general public health and safety. To investigate the levels of public exposure to potentially dangerous substances from automotive emissions, a field study was conducted to investigate the air quality fluctuations and potential relationships between pollutant concentration, traffic flow rate, vehicular type, and type of urban environments. Downtown Los Angeles site was chosen for its high rise characteristics and high urban density. In contrast, the Huntington Beach strip mall was chosen for its relatively low urban density. Measurements within the urban environments were taken during major traffic hours for three days. Emission concentrations were collected by use of DustTraks at several locations within the city, simultaneously deployed with digital video cameras to record passing traffic. Results of observed relations between traffic flow rate, vehicular type, and urban setting will be presented.

Warehouse Workers United: Resisting Multiple Oppressions Among Warehouse Workers in the Inland Empire

Elizabeth Bingle, Sociology
Johnnyra Esparza, Sociology
Mentor: Ellen Reese
Department of Sociology

The sociological theories of Antonio Gramsci, Michael Omi and Howard Winant establish a basis for thinking about the formation of race and class within society. This paper will argue that the Change to Win campaign currently operating in the Inland Valley seeks to organize warehouse workers into a class for themselves and Hispanics into a non-racist racial project through the founding of Warehouse Workers United, a worker organization. The Inland Valley serves as a pivotal point within the global goods movement industry and has transformed the Inland Valley into the warehouse capital of the world. Through a variety of methodologies, including participant observation and interviews, we discuss the impact the goods movement industry and the warehouse industry specifically has had on the lives of workers economically and environmentally. In an area where more than 60,000 warehouse workers are employed through temporary staffing agencies, we examine the strategies and tactics utilized by union organizers in their efforts to organize a group that through standard labor law does not have the right to organize. With the warehouse industry expected to continue to grow through
the next decade, the need for better quality jobs is immediate.

**Site Specific Conjugation of Ketone Containing Peptides onto Glass**

Farouk Bruce, Bioengineering  
Jared Dodson, Bioengineering  
Meng Wang, Bioengineering  
*Contributor:* Yan Wang, Bioengineering  
*Mentor:* Jiayu Liao  
Department of Bioengineering

Chemoselective immobilization involves the use of any of several existing techniques known today in biotechnology to link a substrate of interest onto some support, for purposes that range from high throughput screening, profiling of substances such as enzymes to all kinds of screening processes. Our contribution to the immobilization technology is the direct immobilization of a peptide that was engineered by the Liao Lab. Pre existing immobilization techniques have not made capitalize on the use of certain functional groups that allow for uniform conjugation and high specificity of the positions of conjugations. Our modification is the introduction of a ketone group to the N-Terminal of this sequence as the only point of conjugation. This, we believe renders the process site specific with a quantitatively measurable level of control of various parameters in the conjugation of the peptide onto the surface including conjugation efficiency. We use glass slides as our conjugation supports.

**TA Regional ANOCOVA Modeling Approach for Calibrating EM Survey Data**

Ashley Cacho, Applied Mathematics (Statistics)  
*Project Advisor:* Scott M. Lesch  
Principal Statistician, Statistical Consulting Collaboratory  
*Mentor:* Daniel R. Jeske  
Chair, Department of Statistics  
Director, Statistical Consulting Collaboratory

Electromagnetic (EM) induction surveying technology has been extensively used to map soil salinity and improve farming techniques across the Western United States for the last 15 years. The current surveying and soil sampling procedure relies on statistical sampling and modeling techniques, normally applied on an individual field basis. A new statistical modeling approach based on a regional analysis of covariance (ANOCOVA) model can be used to reduce the number of required soil sampling for a field salinity survey, thus significantly decreasing costs for salinity assessment. Coachella Valley Resource Conservation District (Coachella Valley, CA) has collected individual field survey data for 82 fields over the past seven years. For each field, EM salinity surveys were analyzed to test the correlation between log salinity and log EM survey data. Preliminary quality assurance / quality control checks identified 77 of these field surveys to be reliable and suitable for testing the ANOCOVA modeling approach. The ANOCOVA modeling approach successfully reduced the cross-validated, median mean square prediction error estimate by more than 30% across these 77 fields and improved the overall prediction accuracy in 58 out of the 77 individual fields. In addition to increasing the survey prediction accuracy, the ANOCOVA modeling approach will also facilitate a 50% reduction in the number of soil samples needed to calibrate future EM survey data.

**Size-dependent Adsorption of Natural Organic Matter onto Nanoscale Iron Oxides**

Tyler F. Colyer, Environmental Engineering  
*Mentor:* David M. Cwiertny  
Department of Chemical and Environmental Engineering

Iron oxides naturally abundant in soil and sediments participate in the global cycling of carbon and nitrogen and also play important roles in pollutant transformation and sequestration. In such subsurface environments, iron oxides exhibit a range of particle sizes that extends well into the nanodomain (< 100 nm), and recent evidence suggests that nanoparticles with high surface area represent the dominant reactive form of iron in these systems. In this study, we explore the uptake of a ubiquitous environmental constituent, natural organic matter (NOM), on the surface of hematite (a-
Fe₂O₃) nanoparticles. Hematite with average particles sizes ranging from 10 to 40 nm were synthesized via wet chemical approaches and their adsorptive capacity for NOM was examined in batch systems as a function of pH (i.e., pH edge experiments) and NOM concentration (i.e., isotherm experiments). In systems with comparable hematite mass, results of pH edge experiments and NOM adsorption isotherms revealed that particle size had little, if any effect, on the extent of NOM uptake. Currently, work is ongoing to understand whether the lack of size-dependence reflects inherent differences in hematite reactivity as a function of particle size or losses in reactive surface area due to nanoparticle aggregation. Our results have implications for pollutant sequestration in subsurface environments, as uptake of NOM alters the ability of oxide surfaces to function as sorbents for many common environmental pollutants.

**Relationship between Educational Media and Language/Cognition Levels in Infants and Toddlers**

Shruti Dasgupta, Biology  
*Mentor*: Rebekah Richert  
Department of Psychology

Usage of media in daily life is increasing rapidly. The American Academy of Pediatrics (1999) recommends that children under two should have no exposure to media. However, in recent years, there has been an increase in the number of videos targeted towards toddlers that claim to be educational. This study looks into the effects of infant educational and non-educational media on the language and cognitive abilities of infants 12- to 24-months-old. Media usage data was collected from parents of infants in and around southern California. The results of exposure were determined using several measures including the Bayley Scales of Infant and Toddler Development (BSID) and the MacArthur-Bates Communicative Inventory. Preliminary correlational analysis indicates a positive relationship between the amount of screen time and productive language. However, there was no significant relationship between their cognitive level, as measured by the BSID, and their screen time.

**Electrostatic Properties of Decay-Accelerating Factor (DAF)**

Mohammedzuned Desai, Bioengineering  
*Contributor*: Gabrielle N. Goodman, Bioengineering  
*Mentor*: Dimitrios Morikis  
Department of Bioengineering

Decay-Accelerating Factor (DAF) is an approximately a 75kDa protein composed of four complement control protein (CCP) modules, each of them consisting of approximately 60 amino acids. DAF is a regulator protein of the complement system that contributes to the recognition of "self" from "non-self" by the immune system. Specifically, DAF participates in the regulation of the complement system by accelerating the decay of C₃ convertases, thus preventing amplification of the complement cascade pathways on host cells. DAF is an excessively charged protein, carrying an overall charge of \(-6e\). A detailed characterization of charge topologies within the structure of DAF and the spatial distributions of the generated electrostatic potentials in the surrounding space is essential in understanding the function of DAF. The purpose of our study is to delineate the contributions of each charged amino to the overall electrostatic potential of DAF and individual CCP modules. The rationale of our study is that charge and binding properties of DAF are related and contribute to its decay-accelerating activity. We have applied charge perturbations by performing a high-throughput computational alanine scan, in which every charged amino acid was replaced by alanine. We have subjected the resulted library of mutants into Poisson-Boltzmann electrostatic potential calculations and we have used clustering methods to classify the mutants according to the spatial distributions of their electrostatic potentials. The clustering obtained through electrostatic analysis serves as a predictor of protein functionality and can be used to guide experimental studies and...
potentially design therapeutics targeting autoimmune diseases.

**Densification and Characterization of Nanocrystalline Titania**

Alexander Dupuy, Mechanical Engineering  
*Mentor:* Javier Garay  
Department of Mechanical Engineering

Powder consolidation methods such as Current Activated Pressure Assisted Densification (CAPAD) have seen a significant increase in popularity recently due to their ability to process nanograined materials quickly at low temperatures and with little increase in grain size. Techniques like the CAPAD method utilize an electric current to heat samples while simultaneously applying a compressive load to further enhance densification. Using this method, several samples of titania were created at a variety of temperatures and pressures. The samples were made using titania powder in its anatase phase. These samples were characterized and tested using a variety of methods such as Vickers indentation, X-Ray diffraction, and Scanning Electron Microscopy. The effects of processing parameters on material properties such as hardness, grain size, and density will be examined. Particular attention will be paid to phase composition.

**Four hundred and twenty-five million year old squashed jellyfish from Iowa**

Monica I. Galaviz, Geology  
*Mentor:* Nigel Hughes  
Department of Earth Sciences

Conulariids are an enigmatic group of fossils that lived in the Earth’s oceans from about 580 million years ago until sometime shortly after 250 million years ago. Their biological affinities have been debated for over 200 years because their phosphatic skeleton is unlike that of any living organism, and their soft tissues are unknown – until now! At one time or another have been linked to almost every phylum in the animal kingdom, including mollusks, vertebrates, and corals, or even placed in a completely new phylum of their own. The recovery of an exceptionally preserved specimen from Iowa that is 425 million years old and in which some of the soft tissues have been replaced by silica, provides a fresh insight into these bizarre ancient animals. By using CAT scanning techniques our lab has been able to reconstruct the form of these tissues, which appear to be the gastric lobes of a cnidarian-like, radially symmetrical organism. Our observations support recent arguments that are based on skeleton morphology, which suggest that conulariids are the polyp-phase of an extinct group of scyphozoans (jellyfish).

**Cancer and Liminality: The Roles of Hope and Fear**

Helen Gantenbein, Anthropology  
*Mentor:* Juliet McMullin  
Department of Anthropology

Victor Turner defined liminality as an interim period between two states, marked with ambiguity and disorientation. In the case of cancer, liminality begins at the time of diagnosis-- one is taken from a state of healthiness and brought into a state of uncertainty. After completing treatment, the remissioning patient can remain in a liminal state; the patient is not thought to be ill anymore, but is not quite healthy either. Four interviews with former cancer patients were completed, in which their perceptions of health before cancer diagnosis and after the completion of treatment were discussed. The interviews were qualitatively analyzed for themes-- hope and fear arose as the predominant themes discussed. In the case of those with curable cancers, former patients moved on into a post-liminal phase. Hopes and fears about cancer are able to move the former patient back into a liminal state, even though self-perceptions of health are strong after completing cancer treatment.
Electrochemical Methods for Studying Pollutant Removal by Iron-Based Bimetallic Reductants

Ramon Joshua Garong, Chemical Engineering  
*Mentor: Dr. David Cwiertny*  
Department of Chemical and Environmental Engineering

The use of zero-valent or metallic iron (Fe(0)) as a chemical reducing agent has emerged as a proven technology for the remediation of groundwater contaminated with heavy metals and chlorinated organic solvents. A common approach for improving Fe(0) performance is to generate a bimetallic reductant through the deposition of a second, catalytic metal on the Fe(0) surface. Despite evidence that iron-based bimetallic reductants enhance rates of pollutant removal and produce more environmentally benign degradation products, the surface chemical processes responsible for such phenomena remain unclear. Here, we use electrochemical techniques and complementary surface characterization to probe the influence that three common metal additives to Fe(0), copper (Cu), palladium (Pd) and platinum (Pt), exert on bimetallic reductant reactivity. Bimetallic electrodes were generated by depositing various amounts of each metal additive on an iron wire via displacement plating. Results from open circuit potential measurements and linear sweep voltammetry show that deposition of Cu, Pd, and Pt influences the rate of iron corrosion, but that this rate depends on the identity and amount of metal additive on the iron surface. When the amount of metal additive is relatively low, trends in the rate of iron corrosion rate from water reduction (Pt > Cu > Pd) are opposite to that previously measured for chlorinated solvent reduction. This suggests that pollutant removal in bimetallic systems may be enhanced as a result of the metal additives ability to slow rates of water reduction, thereby increasing the amount of electrons available for pollutant destruction.

Electrochemical Synthesis and Characterization of Ni80Fe20/Cu Multilayered Nanowires

Bryan Goldsmith, Chemical Engineering  
*Mentor: Nosang Myung*  
Department of Chemical Engineering

In a rapidly evolving technological society, the need for new and advanced methods of communication, data storage, and logic function are ever growing. Nanotechnology provides an answer to this problem using a bottom up approach to achieve smaller structures, producing new functionalities and material properties. A good method for this approach is the use of template directed electrodeposition, as it is a cheap, scalable, fast, and a versatile way to fabricate billions of nanowires. Moreover, electrodeposition has been used to deposit semiconductors, metals, alloys, and conducting polymers. Among this diverse group of materials, magnetic alloys are of significant importance for their use in the hard-drive industry, and nanostructured magnetic alloys may provide a means to improve upon their properties and applications. Of the various magnetic alloys, permalloy Ni80Fe20 is one of the most industrially important materials, as its superior magnetic properties, including high magnetic saturation; high permeability, low magnetostriction, and high corrosion resistance make it ideal for giant magnetoresistance (GMR) applications in multilayer and spin valve structures. GMR technology is crucial to hard drives and devices such as iPods and cell phones. Developing a high permalloy/Cu ratio bath for better ferromagnetic/nonmagnetic interfaces to enhance GMR performance is therefore desirable. Studying the change of magnetoresistance (MR) and spin torque transfer effects of single permalloy/Cu multilayer nanowires by the addition of different Cu concentrations is critical for developing new advanced materials for future data storage and logic devices. I have developed a high permalloy/Cu ratio bath to synthesize and characterize NiFe/Cu multilayer nanowires and am beginning to assemble single NiFe/Cu multilayer nanowire devices for further measurements.
The Role of CCR7 and its ligands, CCL19 and CCL21, in the immune response to *Toxoplasma gondii* infections.

Andrew S. Habashy, Biology  
*Mentor*: Emma H. Wilson  
Department of Biomedical Sciences

The protozoan parasite *Toxoplasma gondii* is an extremely common human infection. Through an oral route of infection it is estimated that about half of the world’s population is currently infected. *Toxoplasma gondii* infections lead to the formation of cysts that persist in the brain of the host for life which need to be constantly controlled by infiltrating T cells to prevent reactivation of the parasite and fatal Toxoplasmic encephalitis. *T. gondii* leads to a strong TH1 immune response which ultimately results in macrophages using nitric oxide to kill the parasite in an IL-12 and IFN-g-dependent manner. This project focuses on the chemokine receptor CCR7 and its two ligands, CCL19 and CCL21 and the role these play in lymphocyte trafficking to the site of infection. Following infection, CCR7 deficient mice all succumb to infection by day 12 post intra-peritoneal injection, while WT B6 mice controlled the infection. There is a significant decrease in the amount of CD4+ and CD8+ T cells in the lymph nodes of CCR7−/− mice determined by Flow cytometry. Cytometric bead assays to quantify systemic cytokine levels in the blood as well as ELISA restimulation assays showed a significant decrease in IFN-g production in CCR7−/− mice, due to the inability of lymphocytes to home to the lymph node in a CCR7-dependent manner where they are activated by Antigen-Presenting Cells. Importantly, RT-PCR showed significantly higher parasite burden in the CCR7−/− mice. Through studying CCR7, which shows similar expression in humans as mice, we are exploring mechanisms of the normal immune response and how we may be able to treat immune-suppressed patients.

Doubt and Suspicion in Nouns: Gertrude Stein and the Creative Process

Shannon Hervey, English  
*Mentor*: Katherine Kinney  
Department of English

Though Gertrude Stein is most notably assigned to the Modernist tradition of literature, her unique style undoubtedly works beyond the parameters of Modernism. One of the ways in which Stein both deviates from and works within the boundaries of Modernism is in her intense preoccupation and mistrust of nouns. She questions established relationships between the signifier, a noun, and that which it signifies. This is especially evident in works such as *The World is Round* and also *The Autobiography of Alice B. Toklas*. Though other Modernists seem to shed ornamental language in hopes of preserving a kind of unadulterated meaning in language (Ernest Hemingway being one of these authors), Stein engages in an experimentation with language by using the repetition of sounds, phrases, and words in order to avoid relying on established relationships between words and meaning. In doing so, Stein vehemently rejects grammar and punctuation and does so with the purpose of finding alternative ways to write and communicate without depending on known relationships between words. Stein felt that it was through relying on words that have established meaning where truth was lost. It is for this reason that she used tactics such as rhythm and lack of punctuation to convey meaning. Her ability to not be bound by standards or style in her writing is indicative of her personality and life as well. This is especially evident in her ability to cross country boarders (she was an American that traveled all over Europe) and her unapologetic style of writing is also indicative of the way Stein and her life-partner, Alice Toklas, did not hide their relationship at a time that it was very dangerous to be homosexual and in Europe (WWII). Stein was a boundary-crosser, both figuratively and literally, and her refusal to succumb to expectation was very evident in her writing. Though Stein’s writing both jettisoned and reflected the Modernist tradition, her writing ultimately engaged in an experimental process.
of writing where the very life she led was mirrored insofar as she was extremely apt to experience “otherness” in both her life and her writing.

**Materialism, Memory, and Self-Expression: Success in Caribbean-American Literature**

Shawn Higgins, English  
*Mentors:* Erica Edwards, Emory Elliott  
Department of English

Caribbean immigrants considering migration to the United States in the Twentieth century faced this life-altering ultimatum: continue to live in the “poor but sweet” Caribbean islands, or begin a new life in America that could lead to happiness, depending on both controllable and uncontrollable factors. In this paper, though the analysis of selected Caribbean-American fictional novels, I will showcase writers who give differing perspectives on how Caribbean immigrants can best “succeed” in America. By employing different schools of literary criticism to these works, I hope to better understand both the grievances and the triumphs of Caribbean immigrants and to weigh varying arguments about life in America. I will pay particular attention to the Caribbean-American woman, who Paule Marshall explains has a “triple invisibility, being black, female, and foreign” and how they perceive levels of success in America. I will come to a conclusion concerning the most vital factors effecting Caribbean-immigrant life and to what degree living in America is worth leaving the homeland. These levels of success include various forms of materialist aspirations, triumphs over memory, and embracing freedom of self-expression.

**Role of Women in Conflict: The Case of the Palestinian and Israeli Woman**

Anwar Hijaz, Political Science International Relations  
*Mentor:* Juliann Allison  
Department of Political Science

Many researchers have indicated that most women play a nominal and insignificant role in conflict. Throughout history many have failed to recognize the tremendous role that women have played when looking at politics, in specific conflict. Empirical evidence regarding this issue suggests otherwise. In other words, after extensive research on the issue one could not fail to recognize the tremendous role that women have played, and continue to play until this very day. This involvement in conflict could be seen through forms of activism, military service, social services, and lots more. While many might suppose that a very broad scope is to be found in the topic of women’s involvement in conflict. For this reason the focus of this thesis will be geared toward the role of women in the Palestinian-Israeli conflict. In no doubt in this region of the world there is a clear and visible set of relationships that have been developed over the past sixty years. Arguably one is the relationship of the powerful and the powerless. This unequal relationship has had a significant social, political economic, cultural, psychological, and moral ramification for both men and women, both Israeli and Palestinian. In order to fully analyze and conduct a comprehensive research on this topic, it is vital and absolutely necessary to briefly understand the historic background of the region as it relates to women. Lastly a detailed explanation on the accounts and roles of Palestinian and Israeli women would be explored.

**The Ethnic Cleansing of Palestine**

Manar Hijaz, Political Science  
*Mentor:* William Barndt  
Department of Political Science

This study evaluates the actions of Israel toward the Palestinians. It defines these actions in terms of the definition of ethnic cleansing. This study evaluates the relationship between Israel’s actions and factors Zionism, British colonialism, and United States financial support of Israel. This thesis will show the parallel between the definition of ethnic cleansing and Israel’s actions toward the Palestinians. It will further evaluate the relationship between Israel’s treatment toward Palestinians as a case of ethnic cleansing that is facilitated by these factors: Zionism, British colonialism, and United States financial support of Israel. Clear evidence in the
historic record of Israeli policies that show a goal of wanting to drive out the non-Jewish Arab people will be provided in this thesis.

Notable Problems with Self-Esteem with Distrustful, Gullible People

Alyssa Horton, Psychology  
*Mentor:* Curt Burgess  
Department of Psychology

There are barriers that cause problems in critical thinking. The focus of this research examines the effect of trust and gullibility on a person’s self-esteem. Participants were administered questionnaires on gullibility, trust and self-esteem. It was hypothesized that people who are more trusting and gullible would have higher self-esteem than those who are less trusting and gullible. An interaction was found. There was no effect of trust for skeptical people on self-esteem. However, gullible participants who were less trusting had lower self-esteem than participants who were more trusting. Only gullible participants with low trust scored low on self-esteem. From the literature, one would expect that distrustfulness would be associated with poorer self-esteem. However, these results clearly indicate that this is only true for distrustful people who are gullible. Self-victimization may be involved in the effect of distrust and gullibility on self-esteem, perhaps for reasons related to critical thinking.

Facing the Inevitable: Predictors of Two Types of Acceptance

Carrell L. Jamilano, Psychology  
*Mentor:* Kate Sweeney  
Department of Psychology

There has been some debate as to whether *acceptance* is an adaptive response. Recent work suggests that the discrepancy regarding the outcomes of engaging in acceptance may be due to two types of acceptance: one that leads to positive outcomes and a second that leads to negative outcomes. The purpose of the study is to confirm the distinction between two types of acceptance, determine the strategies people choose to deal with negative, unchangeable events, and predict these strategies from both personality and situational factors. Based on previous work, we propose that positive acceptance is characterized by efforts to share the experience with others and positively accommodate the experience into one’s life, whereas negative acceptance is characterized by rumination, avoidance of the problem, effect dispersion, and expressing emotions in non-productive ways. The study involved 151 college students who were randomly assigned to write about a time when they engaged in either positive or negative acceptance. All participants then completed a questionnaire that included items about their response to the event, characteristics of the event, and personality measures. Use of positive strategies and use of negative strategies were not correlated, providing initial support for two different types of acceptance. Religiosity and optimism predicted both greater use of positive strategies and less use of negative strategies, and self-blame predicted greater use of both positive and negative strategies. In addition, depression, self-efficacy, high severity events, and greater stress predicted use of negative strategies, and time since the event predicted use of positive strategies.

The Effects of Going Green in Corporate America

Christine Kwong, Business Economics  
*Mentors:* Victor D. Lippit  
Department of Economics  
Stephanie Hammer  
Department of Comparative Literature and Foreign Languages

Going Green has become a global issue for major corporations throughout the world. It is important to realize that reducing carbon emissions and implementing new recycling policies may not always be profitable for companies. The purpose of this study is to discuss the impact of recycling policies and going green on the earnings of large corporations. This thesis will also focus on the benefits of recycling and how it influences our ecosystem and curves pollution. Further analysis will compare the environmentally
productive doings of companies in similar industries and measure how much energy usage and carbon emission can be reduced by investing in greener technologies. Finally, it will observe the governments’ responsibility to impose and regulate green policies on major corporations. This paper will demonstrate how companies can increase their value by going green and ultimately save money by cutting energy and labor costs. It will also show how our government can be successful at selectively imposing industry specific green policies.

**Metal-Ligand Cage Complexes As Enzyme Mimics**

Brian Langloss, Chemistry  
*Mentor:* Richard Hooley  
Department of Chemistry

The goal of this study is to synthesize and investigate the catalytic properties of novel metal-organic cage complexes with introverted functionality. These complexes are inspired by the properties of enzymes, which work by providing an active binding site inside which molecules can react. Such pockets contain inwardly-directed functional groups that provide recognition of reactant molecules and a means by which the molecules can be held in place to facilitate reaction. It is rare that metal-ligand cage structures are designed to have interior-based functionality. Our bioinspired cage complexes are intended to be a self-assembling enzyme mimic that provides reactivity in the same manner. By creating these inwardly functionalized cage complexes it is possible to have functional groups held close together within a restricted environment and thus promote the reactions that might otherwise require harsher conditions. The cage complex is created via a metal-organic framework. The vertices are comprised of square-planar Pd*^{2+}* ions while the faces are a bis-pyridyl organic ligand. These two components are combined in solution in a 2:1 ligand to ion ratio. It is seen that the framework self-assembles into the desired cage complex. Furthermore, various functional groups can be directed towards the cage interior via derivatization of the ligand. Its self-assembling nature and functional group variability create a modular synthesis that is both efficient and easy to adapt to the needs at hand. The resultant cage structures have been analyzed and confirmed by NMR spectroscopy and MALDI-TOF Mass Spectrometry.

**Invisible Scholars and the Plight of the Undocumented Struggle for Citizenship**

Raquel Andrea Madrigal, Ethnic Studies and Political Science/Public Service  
*Mentor:* Jennifer Rose Nájera  
Department of Ethnic Studies

The current debate concerning immigration policy and the civil rights movement for immigrants is profoundly complex. Historically, the discourse around immigration has been centered on labor, concerning the conditions, activities, and struggles of workers and other members of the working class. This is problematic in that it does not extend the discussion to include undocumented youth, in particular those attempting to pursue higher education. Simultaneously, there is a lack of discourse concerning the student activism, grassroots organizing, and lobbying at California community colleges, California State Universities and Universities of California for positive legislative reform in favor of undocumented students. The purpose of this project is to document the experiences of AB540 students in institutions of higher education in Southern California. Using qualitative methodologies, this project fills a gap in immigration studies and creates a more sound assessment and full understanding of the immigrant experience. It explores the contradictions in the lives of AB540 students and will sketch various political and economic agendas that impede access to higher education and collegiate success for AB540 students. Furthermore, this study will explore the consciousness and politicization of undocumented students. Finally, it will promote a positive discourse and change that extend to social, cultural, political, economic, and government locations. In this way, it will facilitate the process towards implementing new public policy that specifically addresses undocumented students.
Creating Culture: Religious identity of Muslims in Southern California

Shahab U Malik, Anthropology
Mentors: Susan Ossman
Department of Anthropology
Reza Aslan
Department of Creative Writing
Muhamad Ali
Department of Religious Studies

Muslims in Southern California come from various cultural backgrounds making a diverse community which has differing normative practices. Immigrant communities from India and Pakistan, Southeast Asia, the Middle East, as well as indigenous African American communities are represented in the various Mosques as well as the diverse cultural, political, and humanitarian organizations throughout the greater Los Angeles area (including Orange county, and metropolitan Riverside and San Bernardino counties). The last 30 years has seen a syncretism of cultural and religious practices within the heterogeneous Southern California landscape. This ethnography takes an episodic approach in taking snapshots of Muslim life within the context of specific issues and spaces. Through fieldwork interviews and research of existing materials, the purpose of the project is to give slices of ordinary Muslim life in order to contrast the various conscious and unconscious processes of acculturation. The various Islamic cultures have been negotiating between themselves as well as to westernization and modernity, fusing cultural norms for the benefit of preserving a central Islamic religious identity.

The Developmental Significance of Emotion Expression in Preschoolers’ Play

Ana Kamille Marcelo, Psychology
Mentor: Tuppert M. Yates,
Department of Psychology

Studies indicate that children’s play influences their ability to negotiate their environment. However, there has been little research examining the developmental significance of children’s affect expression in play. This study examined how punitive parenting reported on the Parent Child Conflict Tactics Scales (PCCTS; Strauss and Mattingly, 2007) related to the quality and emotion of preschoolers’ pretend play (N = 120) assessed with the Affect in Play Scale- Preschool (APS-P; Russ, 2004). Further, we also examined how affect in play related to teacher rating of socioemotional adjustment. Among the subsample of 76 children with teacher reports, physical abuse was related to the frequency of positive affect in girls’ play(r= .46, p < .00), but not boys (r =.04, ns). Moreover, for girls, the frequency of positive affect in play related to negative teacher ratings of classroom behavior and emotional adjustment (.28 < r < .35). Findings suggest adversity-induced alteration in children’s emotion processing through play with corresponding implications for socioemotional adjustment.

Individual Differences in Social, Political and Racial Attitudes Associated with Voting Behavior in the 2008 Presidential Election

Robert Martinez, Psychology
Mentor: Carolyn B. Murray
Department of Psychology

The 2008 Presidential Election was not only a politically but also a racially significant event in United States history. The purpose of the present study was to uncover individual differences that may account for one’s choice for presidency. Two hundred twenty-six (226) participants completed a series of questionnaires that assessed candidate preference, degree of attributional complexity, and attitudes toward a variety of political and social issues. Results indicated that individual differences in social, political, and racial attitudes are associated with voting behavior. Those voting for McCain displayed greater prejudice and greater concern for illegal immigration compared to those voting for Obama, while those who were voting for Obama displayed marginally greater attributional complexity and greater concern for economic issues such as demise of Social Security. Although the results are correlational, there are ecologically valid implications, which are discussed in terms of social psychological theory.
**Hiroshima: Propaganda and the Necessity of the Bomb**

Lindsay McDowell, Political Science/History  
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On August 6, 1945 a bomb was dropped on Hiroshima that would change the way we think of modern day warfare. A nuclear bomb, named ‘Little Boy, was detonated above the city completely destroying Hiroshima and much that surrounded it. The devastation included the instant deaths of approximately 70,000 people, a mile radius of absolute demolition, and the total deaths of approximately 200,000. This study examines the necessity of the atomic bombing and the motives behind those who made the decision to use it. In particular, I ask: Was the Hiroshima Bomb necessary? And even more relevant, was it believed to be necessary at the time? In response to these questions, I investigate and analyze current research that looks at what the public has been taught about the use of the atomic bomb, what alternatives existed to its use and who supported these alternatives? And finally, why these alternatives were not chosen? I argue that the Hiroshima bombing was not necessary and was not believed to be so at the time. Instead it was used to as a political tool to enforce America’s position in the world as a superpower and to intimidate Russia. I support this argument on the basis of declassified government documents, opinions of those involved in the decision-making at the time, and the intelligence of political scientists and military specialists. My analysis suggests that, indeed, the Hiroshima bombing was not necessary. My findings show that political leaders have and continue to control and manipulate public opinion using limited and select information to justify decisions made in the name of the state but that in fact are made to promote their own political agendas.

**Segmental Differences in Colonic Transporter Expression.**

Carlo Mejia, Biology  
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Division of Biomedical Sciences

It has long been recognized that the colon is divisible into several distinct segments with different transport functions. The proximal segment of the colon absorbs NaCl and water rapidly by an electroneutral process that appears to involve a functional coupling between Na/H exchanger-3 (NHE3) and a Cl/HCO 3 exchanger designated as DRA (SLC26A3); the activity and/or capacity of this mechanism is known to diminish along the length of the colon. The distal segment also exhibits an additional mechanism of Na⁺ absorption in response to dietary Na⁺ and volume depletion that involves electrogenic Na⁺ flow through ion channels (ENaC) situated in the apical membrane of the surface epithelial cells. The purpose of this project is to delineate the precise location along the colon where the expression of transport machinery changes. We examined the regional expression of NHE3, DRA, and ENaC in the mouse and rat colon by confocal immunofluorescence microscopy. Consecutive one cm segments from cecum to anus were excised and fixed in formalin. Thin frozen sections were labeled with specific antibodies against NHE3, DRA, and ENaC along with an Alexa-Fluor-488 conjugated secondary antibody. Fluorescence will be visualized with a Zeiss LSM-510 confocal microscope under conditions allowing for quantitative imaging (with digital pixel intensity proportional to fluorescence). Average pixel intensities along the apical margin of the surface enterocytes are to be measured. Preliminary results indicate different gradients of expression of NHE3 and DRA along the longitudinal axis of the colon, suggesting that functional coupling between these ion exchangers does not occur in the early segment of the colon. "Funding for this project was provided by the Nathan and Violet David Foundation, the Howard Hughes Medical Institute, and the Medical Scholars Program."
Healthy Discussion: The Effect of Deliberation on the Advancement of Knowledge

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Department of Political Science

The typical adult American juggles multiple responsibilities, including working full-time, raising a family, having a personal life, and maintaining a healthy lifestyle among other things. In addition to this, they are expected, as responsible citizens, to inform themselves about political affairs and participate in a wide variety of civic activities like voting on issues and shaping policies. Every American learns about political, social, and economic issues from a variety of resources. These resources are endless as they can be books, magazines, newspapers, the classroom, teachers, friends, and family. In a democracy, citizens should consult previously learned and new information about any particular issue to make informed decisions during election time or even everyday life. This paper seeks to understand more fully how the American public best learns about important issues. I argue that despite the multitude of learning resources that Americans have to make any political decision, they actually learn better about important issues through deliberate discussion with other active, interested individuals. I examine this thesis by conducting an experiment to compare the knowledge gained by participants of groups who learn about a controversial issue—both sides of an argument—and come to mutual/collective to the level of knowledge acquired by members of groups who learn about the same controversial issue but deliberate only with others who are familiar with “their” side of the argument. On the basis of the results of this experiment, I conclude that groups of people who deliberate on the “whole story,” both the opposition and the support of an argument, not only attain more knowledge about the issue, but also can come to respect of the other side. This result implies that a democracy could become better informed, make more conscious decisions, and most importantly come to greater respect for the opposite side by increasing awareness of a broader view of certain policies or issues.

The Cultural and Geographic Factors of Student Mobility

Salim Mhunzi, Sociology  
Danielle Chodak, Sociology  
*Contributor:* Elizabeth Cavins, Political Science  
Hiroko Inoue  
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Department of Sociology, IROWS

We are moving into a shared and interconnected world. Programs such as Study Abroad and The International Student Exchange create opportunities for spatial exchange which further expand the interconnectedness between people of the periphery and semi periphery. Since the 1970’s, the number of students going abroad for higher education has been steadily increasing. This growth has been fueled primarily by students from Asian countries. Historically Europe and North America have been the primary host nations. The international mobility of students is examined in 1976 and 2005 using social network methods. Examining the cultural and geographical variations of students, our research focuses on mapping the mobility of students through not only the geographic, but the cultural identities of groups (i.e. language, food, hobbies, religion) to give us an understanding of the interconnection between education and global relations.

Distributed Power Generator Dispersion Simulation in a Water Channel

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*Contributors:* Christian Bartolome, Shiyan Chen, Xiangyi Li, Mechanical Engineering  
*Mentor:* Marko Princevac  
Department of Mechanical Engineering

Power grid failures, always increasing energy demand and cost are major concerns for southern California businesses. To be able to continue with normal operations during potential blackouts and to decrease the energy cost many institutions, including restaurants, schools, hotels and hospitals, are equipped with small
power generators known as distributed power generators (DG) as opposed to large centralized power plants. Although this solves the problem of power dependency, these generators may create localized air quality problems. Since DGs are by rule situated in urban environments, the exhaust from DGs may be harmful to the public in close range, unlike typical large power plants that are positioned intentionally far away from urban areas. To investigate potential health impacts of DGs geometric, kinematic and buoyancy similarity parameters were satisfied with a scaled model of the DG facility in Palm Springs from which a dye was dispersed into the water channel. Water channel experimental results for ground level concentrations for the Palm Springs setup were validated with comparison to field measurements taken in the summer of 2008. Investigations used a 2-D Particle Image Velocimetry and Planar Laser Induce Fluorescence techniques. Laboratory experiments were conducted to investigate (1) concentration gradients, (2) turbulence within the plume caused by (2a) buoyancy and (2b) large scale ambient flows, (3) a relationship between the concentration gradients and turbulence, and (4) ground level concentrations. Laboratory Results will be presented.

The Genesis of the Party of God: the development of Hezbolah in Lebanon

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Jeffrey Sacks
Department of Comparative Literature

What are the factors that have led Hezbollah to gain substantial influence in Lebanese politics, with the support of Lebanese citizens at a time when many, even in the Arab world are skeptical about “Islamic organizations?” How have these factors influenced the region politically, socially and religiously? The Taif Agreements and events leading up to the document, along with financial support from Iran, political support from Syria, have together ensured the success of the organization in gaining political and social legitimacy among the Lebanese, Muslim and Christian alike. To demonstrate the veracity of my argument, I employ a comparative case study of Hezbollah and Amal -another Lebanese militant organization that failed to maintain a stronghold in Lebanon - that includes analysis of data, documents, and scholarship on financial and political support provided to Hezbollah over the past 26 years. From since its inception in 1982, Hezbollah has had considerable amount of status among its Lebanese peers, and the Arab world in general. It has relied on Syria and Iran for the political and social support it needs to maintain its popularity among the Lebanese. This popularity has given Hezbollah enough encouragement and members to become a strong political presence in the region. Syria and Iran, both being included in President George Bush’s “Axis of Evil” states, and what most Arabs considered the 2006 victory of Hezbollah over Israeli assault makes this issue important to United States national security.

Bombing Hills or The Follow Through

Curtis Miller, Theatre
*Mentors:* Kate Anger and Eric Barr
Department of Theatre

This play resulted from the challenge of using modern drama—an art form that has been widely dominated and shaped by secular humanism—to explore Christian faith in the modern world. The play utilizes dramatic action, and realistic dialogue to tell the story about the turning points that comprise a journey of religious faith. The ideas are explored through Trey, a suicidal young man and former Christian, who searches for a final conclusion about life and belief. His psyche is represented metaphorically through the setting of an office and his conscience by Alethia, a young woman who forces him to revisit events in his life and re-live their significance. While examining
Trey’s life, the play blends linear narrative with non-linear devices, such as breaking “the fourth wall” (the imaginary wall that separates audience and actor). It also calls on the actress who plays Alethia to create multiple characters who propel the story of Trey’s life. Philosophically, the play investigates the emotional depth behind one’s reasons for believing, or disbelieving, in two-thousand-year-old claims of divinity. As the characters discover, the arguments for or against the truthfulness of those claims are surrounded by deep paths and subjective, human experience.

Concurrent Relations Between Preschool Personality Profiles and Socioemotional Adaptation

Erica R. Morales, Psychology
Contributor: Chelsie D. Sampayan, Psychology
Mentor: Tuppett M. Yates
Department of Psychology

Accruing evidence suggests that personality attributes in young children may be related to psychosocial functioning. However, debate remains about how to reliably and validly assess personality in young children (Weir & Gjerde, 2002). Studies of child personality development typically employ “educated evaluators,” such as parents and teachers who have known the child for extended periods of time. In contrast, this study examined child personality organization using naïve observer ratings of child personality. We evaluated the reliability and validity of observer-rated personality attributes among preschoolers during a 3-hour laboratory assessment (N = 119; Age 3.9-4.6). Two coders rated each child using the California Child Q-sort (CCQ; Block, 2008). Interjudge reliability was excellent across the 100 items (mean ICC =.58; SD =.19). Findings on 76 cases with teacher data show concurrent validity of observer-rated personality profiles with teacher ratings of classroom aggression (Reactive and Proactive Aggression; Dodge & Coie, 1987) and behavior (Child Behavior Questionnaire; Rothbart, 2001). Adaptive personality profiles, such as ego-resilience, related to lower levels of aggression and higher behavior scores of soothability and inhibitory control. Maladaptive profiles, such as undercontrol, related to higher levels of aggression and impulsivity as rated by teachers. These findings suggest that observer ratings may reliably and validly assess personality patterns among preschool-aged youth, and may be used as an efficient and accessible method for assessing pediatric personality functioning.

Parent-Child Separation: The moderating role of parental support

Valerie Nolte, Psychology
Mentor: Tuppett Yates
Department of Psychology

Previous studies indicate a moderate to strong positive relationship between parental separation and negative adolescent outcomes. However, studies also show that other factors, such as family environments before and after separation, can moderate these effects. Unfortunately, none of the studies to date examine both parental support and parental separation as an environment. The present study addresses parental support as a moderator of adolescent outcomes when faced with parental separation. Adolescent outcomes include peer and romantic relationships, anxiety, depression and substance use as measured retrospectively in a diverse university sample. Based on previous studies, the primary hypothesis is parental separation will negatively impact adolescents. Exploratory analyses in this study will also examine the influence of the duration of separation, ethnicity, and the gender match between child and separated parent on outcomes. The second aim of this study is to examine the role of the home environment and how that influences young adult outcomes. To that end, the second hypothesis of this study is that parental support will moderate this relationship, such that high support from a custodial parent will be associated with lower levels of negative adolescent outcomes. Results indicate that extended separation from parents negatively affects adolescents on multiple predicted domains. Post hoc mean comparisons illuminate significant gender interactions between parental support and risk taking outcomes. Direct
implications of parental separation on adolescent development are discussed.

**Capturing the Pain: The Ethics of War, Conflict, and Crisis Photography**

Shady Grove Oliver, Foreign Languages/Religious Studies  
*Mentors:* June O’Connor  
Department of Religious Studies  
Georg Michels  
Department of History  
D. Charles Whitney  
Department of Creative Writing

With the advent of photography, it suddenly became possible to show people ‘true’ images of things they otherwise would only be able to read about and imagine. I examine the history and culture of tragedy photography from wars and international conflicts to famines and medical crises. I then analyze several overarching ethical quandaries inherent to crisis photography. As case studies, I look at the war images of photographers such as James Nachtwey. I analyze the potential problems of voyeurism, viewing human beings as subject matter, overlooking cultural sensitivity for the sake of a picture, the photographer’s crafting of an image (what is shown and what is left out), a photograph as ‘truth’, seeing pain and violence as entertainment, and the ethical issue of placing photographers in potentially fatal situations. In addition, I argue that because of a recent American societal acceptance of violence in entertainment and the media, there is a call for more graphic or visceral images to effectively communicate ‘the news.’ To illustrate this point I look in particular at the video game “BioShock” in which players must photograph their victims to progress through the levels. Finally, I argue that although potentially voyeuristic among other things, photography has become an integral part of how we understand war, conflict, and crisis situations in modern society.

**Spontaneous Shrines: Dealing with the Pain of Loss on the Roadside and the Internet**

Shady Grove Oliver, Foreign Languages/Religious Studies  
*Mentors:* Ivan Strenski, Vivian-Lee Nyitray,  
Department of Religious Studies

Spontaneous shrines are spaces where a loss (typically an unexpected death or disaster) is dealt with through a physical preservation of communal memory. Unlike flowers or cards left at gravesites, spontaneous shrines typically appear at the actual location of the tragedy. I look at the recorded history of spontaneous shrines with a specific focus on roadside accident sites. Through fieldwork in Southern California and case studies, I examine the culture of spontaneous shrines in terms of their origins, upkeep, and manner of presentation. I argue that spontaneous shrines are part of the overarching idea of the material culture of both personal spirituality and American civil religion. I then argue that with the advent of the internet and its prevalence in the daily lives of the younger generations, spontaneous shrines as websites and weblogs dedicated to the deceased present an immaterial space to preserve communal memory and provide a safe space for mourning.

**Effects of Traditional Religious Beliefs and Personal Gullibility on Happiness**

Jennifer L. Orlando, Psychology  
*Mentor:* Curt Burgess  
Department of Psychology

A recent Gallop poll showed that those who are religious are about twice as happy as those who are not. It follows from this that those who are more skeptical may not be as happy. To assess the relationship between traditional religious beliefs and gullibility on happiness, 102 undergraduate students completed a set of online questionnaires (a Paranormal Beliefs scale, Skepticism, Gullibility, and Trust Scale, and the dependent variable was Subjective Happiness). The results were straightforward. Gullible people who hold traditional religious beliefs are happier than gullible people who do not hold the
traditional beliefs. However, there was no difference in happiness as a function of religious belief for those who were more skeptical. What is important is finding the balance between being realistic and being religious in order to be happy.

**β56γ3 and ATM interaction in relation to the p53 tumor suppressor protein.**

Michael Panowicz, Biochemistry Medical Sciences Emphasis
*Mentor: Dr. Xuan Liu*
Department of Biochemistry

P53 is a known cancer/tumor suppressor protein that arrests the cell cycle during DNA damage and enacts various up regulatory pathways to repair the damage. If the DNA damage is irreparable, then p53 has also been shown to lead to apoptosis. The p53 protein is regulated by various post-translational pathways in the cell. Previous studies in our lab have shown that the β56γ3 PP2A protein interacts with p53 in one such post-translational, regulatory pathway. The β56γ3 PP2A complex dephosphorylates p53 at Thr55 which stabilizes p53 and leads to cell cycle arrest. Interestingly, there appears to be multiple possible ATM consensus sites present in the β56γ3 protein. ATM is another protein kinase that is involved in cell stress regulation cycles that acts to stabilize various proteins in response to cell stress. To verify if ATM phosphorylates β56γ3, three β56γ3 mutants were created: first a S437A mutant, secondly a S510A mutant, and finally a S437A & S510A double mutant. Changing the ATM phosphorylation sites on β56γ3 will, theoretically, inhibit or altogether prevent ATM phosphorylation. These purified β56γ3 mutant proteins were used in an in-vitro experiment to test their phosphorylation by ATM in comparison to wild type β56γ3. As a result, we discovered that ATM does directly phosphorylate β56γ3. However the exact site of ATM’s phosphorylation on β56γ3 is still unclear. Further studies are currently underway to determine which of the remaining two ATM phosphorylation sites on β56γ3, 437SQ or 510SQ, is the site of ATM phosphorylation.

**RBR Gene Regulates Stem Cell Maintenance In Arabidopsis Shoot Apical Meristem**

Prince Sasis, Biology
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Department of Botany and Plant Sciences

Arabidopsis shoot apical meristem harbors the pluripotent stem cells in the shoot apex. For the continuous growth of a plant, maintenance and differentiation of the stem cells are the main prerequisites. However, it is unknown how these stem cells are maintained in the shoot apex. Studies using the root have shown that local reduction of RBR protein increases the number of the stem cells without affecting cell division rate, while the increased levels of RBR depletes the stem cell population. This indicates the critical role of RBR in maintenance of stem cell pool in plants. The main objective of this study is to understand the function of RBR in shoot apical meristem. Therefore, we are developing a transient system to increase and decrease locally the level of RBR in shoot apex. An RNAi construct designed to knock down the RBR levels in the stem cells. Contrary to this we will also express ectopically RBR in stem cells and will look stem cell pool behavior using the live imaging studies. This approach will reveal the function of RBR in stem cell maintenance in shoot apex.

**A Preliminary Study on Preheating Kinetics**

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Biological conversion of lignocellulosic biomass to fermentable sugars starts from a catalyzed or un-catalyzed (water-only) pretreatment to disintegrate the crystalline cell wall structure and enhance the susceptibility to cellulase enzymes. Pretreatment involves the preheating of biomass slurry to aimed temperature by a heating source set at or higher than target,
though the duration of preheating was usually excluded from the stated pretreatment time or severity factor. Our preliminary observations showed prominent releasing of sugars and sugar degradation products during preheating prior to water-only or dilute acid pretreatment. Therefore, attention is needed on preheating kinetics to understand the cellulose and hemicellulose sugar solubilization and to minimize sugar degradation during preheating. In this study, we tracked temperature profiles at combinations of target (140-220 °C) and varying preheating temperatures that gave 0.5 to 10 min preheating time in the tube and Parr reactors loaded with corn stover and pure xylan at selected water-only and dilute acid pretreatment conditions. The release of glucose, xylose, their oligosaccharides and their degradation products (furfural and HMF) were monitored at tested preheating conditions and kinetic models were further set up based on the baseline data to correlate preheating and sugar solubilization and degradation in particular hemicellulose sugars. These results provide new knowledge on preheating and help a better understanding of pretreatment of lignocellulosic biomass.

**Repair and Modification to the Steam Gun**

Manjot Singh, Chemical and Environmental Engineering  
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Department of Chemical and Environmental Engineering

The steam gun pretreatment reactor is used for investigating approached to biomass pretreatment requiring steam heating, particularly steam explosion pretreatment with or without catalysts. Steam can provide rapid heat up of biomass needed to control the temperature history, and rapid pressure release provides rapid cool down to terminate the reaction. Steam explosion can help disrupt the structure of cellululosic biomass, leading to an improved digestibility of the pretreated fibers because of the depolymerization, disaggregation and decrystallization. The typical operation temperature rage for the steam gun is 140-210 °C. The Fulton electric steam boiler that we have provides high pressure steam for steam explosion pretreatment of biomass and can generate up to 800 psi, however, typical temperature requirements for the steam explosion pretreatment range from 30-260 psi (140-210 °C). The range of biomass loading for this gun is 200-350 g of dry weight. Another Steam Gun has to be added to the system; so to run both steam guns using the same boiler, both the steam guns will be placed parallel to each other. In order to reduce the water droplets in the sample, steam trap will be added, which will be a combined system of demister (separator), strainer, steam trap, check valve and diffuser. Another modification planned is the addition of strainer and air vent, to let the air out of the gun before steam comes in, instead of it being done manually. Releasing the air manually still leaves a chance of air being left in the gun or the chance of too much steam being released which may affect the pressure and the temperature. A further modification in discussion is the addition of insulated heating tape along with the temperature control unit, to minimize the steam condensation while travelling from the boiler to the gun. A rolling platform will also be part of the modification for the ease and safety of the user to be able to load the reactor with the biomass.

**2-Ethylpyridine, Pyrazine, and Nicotine Chemicals in Cigarette Smoke, Affect Attachment and Proliferation of Mouse Embryonic Stem Cells**

Erica Tate, Biology  
*Contributor:* Sarah Diamond, Biology  
*Mentor:* Dr. Prue Talbot  
Department of Cell Biology and Neuroscience

Many studies have demonstrated that cigarette smoke exposure can have detrimental effects on reproduction. Here, we are using mouse embryonic stem cells (mESC), derived from the inner cell mass of blastocysts, as a model for pre-implantation embryos. Prior studies in our lab found that cigarette smoke solutions had an adverse effect on mESC growth. To understand the effects of individual cigarette chemicals on mESC attachment, survival, and proliferation,
The current study tested three chemicals; 2-ethylpyridine, pyrazine, and nicotine. In each experiment, mouse D3 ESCs were plated on 0.2% gelatin without the presence of a fibroblast feeder layer. Each chemical was tested on mESCs individually by treating the cells with 2-ethylpyridine at 10^{-10}\text{M}, 10^{-8}\text{M}, and 10^{-6}\text{M} doses or pyrazine or nicotine at 10^{-10}\text{M}, 10^{-8}\text{M}, and 10^{-4}\text{M} doses dissolved in mESC medium. The number of attached cells was counted at 6, 24, and 48 hours; the data obtained showed that each chemical affected mESC attachment and proliferation differently. 2-ethylpyridine and pyrazine slightly inhibited mESC attachment, while nicotine significantly inhibited mESC attachment dose dependently. 2-ethylpyridine and pyrazine inhibited cell proliferation dose dependently, with 2-ethylpyridine appearing to be more potent than pyrazine. Yet nicotine stimulated mESC proliferation. The proliferative effects of nicotine were reduced by treating cells with tubocurarine. These data show that chemicals in cigarette smoke can have different effects on stem cells and could interfere with the maintenance of stem cell populations, including those in pre-implantation embryos.

The Media, Capitalism, and Eating Disorders

Brenda Tedder, Women’s Studies
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Department of Women’s Studies

This paper is about the connection between capitalism and eating disorders. Through the use of books, scholarly journals, and articles, this paper will show that the media is a reflection of our capitalistic culture that promotes adolescent girls and young women to be thin by pushing weight loss products. This push for women to obtain the ultimate perfect, thin body exacerbates symptoms of eating disorders and prolongs the patients’ suffering. Culture promotes the notion that thinness is equal to success and beauty. As a result, young women have admitted to rationing food, binging and purging, or participating in extreme exercise for the purpose of looking thinner. The fashion, diet, and fitness industries all profit from these women’s self destructive behavior. The fashion designers and magazine editors make a profit because they design clothes and feature rail thin models in their fashion magazines. Those who have criticized these capitalist industries believe that anorexic looking models will give teenage girls the wrong impression about body image. The diet industry turns a hefty profit by exploiting vulnerable women’s fear of gain weight, thus earning billions of dollars every year. The fitness industry makes a billion dollars every year by selling exercise DVDs, home gym equipment, and gym memberships.

Enhancement of Sperm Activation by Cholesterol Efflux in *Caenorhabditis elegans*

Tung Tran, Biology
*Mentors:* Juan Fraire Zamora, Richard A. Cardullo
Department of Biology

Cholesterol plays an important structural role within the plasma membrane. Previous studies have demonstrated that cholesterol is an important regulator of both membrane fluidity and membrane microdomains, also known as lipid rafts. Lipid rafts are dynamic aggregations of lipids and proteins that play major roles in many signal transduction pathways. For example, the disruption of these microdomains by the efflux of cholesterol can induce the signals necessary for capacitation in mammalian sperm. Lipid rafts may also be involved in the acquisition of motility in nematode sperm, in a manner analogous to mammalian sperm. In the nematode *Caenorhabditis elegans* the acquisition of motility is referred to as sperm activation. During this process, the sessile spherical spermatid undergoes membrane rearrangements that result in the extension of a pseudopod. We hypothesized that these membrane rearrangements are due to the disruption of microdomains through cholesterol efflux. In order to assess the effects of cholesterol removal on *C. elegans* sperm activation, we isolated non-motile sperm from adult male worms. The non-motile sperm were treated with 2-OH-propyl-β-cyclodextrin, which removes cholesterol from the plasma membrane. Using a phase contrast microscope, we then recorded the proportion of cells that extended a pseudopod in response to the *in vitro* activators.
Triethanolamine or Monensin. Cholesterol removal significantly increased the proportion of cells that extended a pseudopod in response to the activators. These results suggest that the initial membrane rearrangements during sperm activation are due to cholesterol removal which may function by disrupting membrane microdomains.

**Signaling in the shoot apical meristem of *Arabidopsis***

Nolan Ung, Botany and Plant Sciences  
*Contributors:* Li Feng Yu, Shang Wu  
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Department of Botany and Plant Sciences

The shoot apical meristem (SAM) is responsible for post embryonic development in plants and is subdivided into discrete functioning zones, the Central zone (CZ), peripheral zone (PZ) and rib zone (RZ). WUSCHEL (WUS) is a homeobox gene involved in stem-cell identity that is expressed in the rib zone and is negatively regulated by CLAVATA3, which is expressed in the Central zone. This creates a negative feedback loop which maintains the proper number of stem-cells in the SAM. Two redundant homeobox genes *PENNYWISE* (*PNY*) and *POUND-FOOLISH* (*PNF*) promote flower formation during reproductive development and are expressed in the PZ of the SAM. In *pny pnf* double mutants, reproductive-like shoots fail to form flowers and produce leaves indefinitely. My goal is to understand the relationship between PNY and PNF and how they interact with the CLV3-WUS negative feedback loop. It has been found that CLV3 expression expands into the periphery of the SAM in *pny pnf* double mutants. In addition, WUS expression is highly reduced in the *pny pnf* SAM. To determine if the reduced levels of WUS are responsible for the non-flowering *pny pnf* phenotype, *pny pnf clv3* triple mutants were constructed. *pny pnf clv3* triple mutants produce flowers composed of female reproductive-like organs. mRNA in situ hybridization demonstrates that the WUS expression domain expands laterally and apically. Thus, preliminary data suggests that PNY and PNF negatively regulate CLV3 expression in the PZ of the SAM. This regulation may be important for WUS signaling to the PZ to promote flower formation.

**Beyond Entertainment: The Translation of Media Standards and Social Inequality on the Female Conscious***

Arthur Unzueta, Psychology  
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Department of Psychology

Women may face many levels of social inequality because of how our society is structured to reinforce the subordination of women. Although the effects of gender discrimination are manifold, previous research indicates that women who feel ineffective in important and complex domains of the self (e.g., interpersonal relationships and/or professional identity) are more likely to turn towards their appearance as something they can more steadily control (Jarry, 1998). Further, since many different forms of media (e.g. radio, television, and magazines) place excessive emphasis on body-related self-worth, women who express low self-esteem/efficacy and high levels of internalization of media standards will be more likely to turn to these forms of media for positive recognition. Drawing on a large survey of college students (*N = ~500*), the current study employed measures of perceived social inequality due to one’s sex, self-esteem, media use, body dissatisfaction, internalization of body standards, and self worth to better evaluate if poor global self-esteem is potentially influenced by adherence to social beauty standards and inequality. In addition, a self-concept hierarchy was administered to test the salience of body image in participants’ schema of self-worth. The current study extends prior research because it moves beyond current understanding that media use is associated with reduced self-esteem for women to explain why and for whom these effects may be especially pronounced. Specifically, this thesis considers the influence of women’s perceived inequalities and internalization of body images rather than just the effects that media may have on body dissatisfaction and self-esteem.
The Role of Electrostatics in the Function of Factor H, and its Relation to Complement System-Mediated Disease

Homero Vazquez, Bioengineering
Contributors: Gabrielle Goodman, Aliana López De Victoria, and Chris Kieslich
Mentor: Dimitrios Morikis
Department of Bioengineering

Factor H (FH) is a plasma glycoprotein responsible for recognition of host cells and tissues. FH has a unique chain-like structure, consisting of 20 complement control protein (CCP) modules. Functional sites in different modules permit a variety of interactions with immune system proteins and surface markers in host tissues. Electrostatic interactions drive the recognition and binding of FH with target molecules due to the excessively charged nature of the CCP modules. Mutations at charged “hotspots” at the surface of key modules of FH have been linked to autoimmune diseases; these mutations disrupt the charge density of the affected CCP module and impair the proper function of FH at the molecular level. In this study we compare all 20 CCP modules against each other to delineate the electrostatic differences that mediate specific binding abilities with target molecules and surfaces. Our computational protocol is based on the calculation of electrostatic potentials using the Poisson-Boltzmann equation, and the clustering of the spatial distributions of electrostatic potentials. More specifically, this analysis compares two methods of clustering electrostatic potentials aiming to gain accurate insight about how protein electrostatics drives the biological function of FH. This study allows us to establish correlations with existing experimental biological data about the function of FH and to make predictions about the unknown functions of most of the CCP modules. Our study guide future experiments aiming in the identification of novel interaction sites and points of immune system regulation.

Fascism in the 21st century: Do authoritarian ideologies still predict racism?

José Villalobos, Psychology
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Department of Psychology

Facism is usually defined as an authoritarian ideology where individuals discard self-interest to follow an authority figure who rules for the collective nation or race (Adorno et al, 1950). Although several studies have shown links between authoritarian tendencies, as measured by the California F-Scale (Adorno et al, 1950), and forms of bias against racial outgroups (i.e. Boliver, 1999, Eisenman, 1986, Downing & Monaco, 1986), the scale itself has been a source of controversy. Adorno et al’s claim that the F-Scale measures authoritarian personality has been debated and even rejected outright by some researchers (Ray, 1988). Nevertheless, significant relationships between F-Scale scores and degree of prejudice have continued to emerge. Eckhardt (1988) explained that the scale actually measures authoritarian ideology (“Fascism at the extreme”), and not a personality type. Under the assumption that Fascist ideas are based on inequality (Eckhardt, 1988), we hypothesize that authoritarian ideologies can predict racist attitudes, even when modern racism scales, such as the Quick Discrimination Index (QDI) are employed. Eight hundred and ten ethnically diverse university students were administered a demographics questionnaire, a 30-item version of the California F-Scale, and two components of the QDI. One component of the QDI measured attitudes toward racial diversity (cognitive) and the other measured personal affective comfort with interracial interactions (Ponterotto et al, 1995). Two one-way ANOVAs supported the hypothesis that F-scale scores predict cognitive and affective prejudice. This finding of an increase in level of authoritarianism being associated with an increase in racial prejudice is confirmed by previous research.
Investigating Lemon Ancestry Using Microsatellite Markers

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Lemon (*Citrus limon*) is widely cultivated around the world for its culinary uses, but its ancestry is not well understood. Within the genus *Citrus*, many cultivated species are considered as hybrids from these three ancestral species: citron (*C. medica*), pummelo (*C. maxima*) and mandarin (*C. reticulata*). Lemon is a natural hybrid derived from these ancient species and earlier work had hypothesized that lemon might be a hybrid between citron and sour orange. To this hypothesis, we analyzed microsatellite (simple sequence repeat, SSR) markers from three lemons, seven citrons, two sour oranges, Mexican lime, Ruby blood orange, Wild lemon and Chinese limon. However, the results obtained from these markers did not fit the previous lemon parentage model. Manual analysis of alleles of 88 SSR loci from three different lemon varieties, showed that of lemon alleles, approximately 63% occur in both citron and sour orange, 20% in sour orange only, 15% in citron only, and 1.5% in none of these species. Our data will be combined with that from other ancestral species and reanalyzed to clarify the origin of lemon.

The repeatability of organ mass measurements after preservation in 5% formalin.

Danielle Wickman, Biology  
*Contributor*: Ted Yau  
*Mentors*: Ted Garland, Christopher E. Oufiero, David Reznick  
Department of Biology

My project is an Upper Division Honors Thesis and is focused on how methods of preservation in 5% formalin affect the repeatability of organ mass measurements. While certain studies have shown that preservation of whole organisms in formalin can affect their mass at a later date, few studies have examined the effects of preservation on the organs themselves. The repeatability of a trait is useful for several reasons; including the reliability of the measure in question and ensuring the methods of data collection are congruent. In this study, we examined the effect of preservation of heart and gill mass measurements, organs directly linked to respiration in fish. We examined and compared the repeatability and shifts in mass of these traits in *Poecilia reticulata* and *Xiphophorus maculatus*. Organs were initially dissected out after being preserved for several months, blotted dry, weighed, and then placed back in a solution of 5% formalin for an additional 2-4 months. Organs were then weighed for a second measure, placed back in 5% formalin, and weighed approximately ten days later for a third measure. Through statistical analysis of the data, it was shown that most of the organ mass measurements shifted over the time of preservation, but the measures were repeatable, that is the ranking in organ size for individuals remained the same for all measurements except *P. reticulata* heart mass. Our results suggest that although 5% formalin preservation may affect organ mass, the repeatability of those measurements is consistent in two species of Poeciliids.

The Child Leader Project: From Idea to INGO in 365 Days

Samantha Wilson, Global Studies  
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The elusive process of “globalization” has provided new and transformative opportunities for interconnection and communication alongside increased inequality and ignorance. However, with a strengthened awareness of interconnectedness, individuals have new opportunities to organize and act collectively to address those inequalities that prevent the social mobility and improved livelihoods of their fellow global citizens. Although there are many tools to addressing inequalities of access and seeking to “empower” those communities bypassed by globalization, access to quality education within marginalized communities is a key component to confronting socio-economic...
injustice and cultivating a knowledgeable and skilled citizenry. In response to these ideas, I have spent the last year developing the Child Leader Project (CLP): an international non-governmental organization (INGO) that provides leadership training and mentorship towards higher education for underserved youth in South India. This year CLP provided leadership training to twenty youth in rural India, in which UCR students facilitated programming on the topics of higher education, social service, conflict resolution, and international dialogue. CLP is preparing to expand this summer to collaborate with a child labor rehabilitation organization and slum and street children advocacy center, as well as support an international exchange between high school students from the Inland Empire. This presentation will present the theoretical motivations behind CLP (the importance of citizen action and the role of INGOs in “development” discourse, dialogical pedagogy and “empowerment,” and postcolonial theory) as well as how CLP applies and adapts these ideas through its work with youth in South India.

Relationship between sexually selected traits and compensatory traits: a study in Xiphophorus (swordtail and platy fish)

Theodore T. Yau, Psychology
Mentor: Christopher Oufiero, David Reznick
Department of Biology

Sexually selected traits are physical features that can help an individual attract mates, enhancing their chance of producing more offspring, and increasing their fitness. However, sexually selected traits may also come at a cost. One potential cost is a decrease in locomotion caused by exaggerated sexually selected morphologies. In response to the cost of trait, the species may evolve compensatory traits to offset the cost. Therefore, it would be interesting to examine the relationship between sexually selected traits and potential compensatory traits. The fish genus Xiphophorus is an ideal system for such studies because the genus has ~20 species that vary in the degrees of the expression of a sexually selected trait, the “sword,” that has the potential to reduce locomotor abilities. However, compensatory traits that are directly linked to aerobic means of locomotion may also vary. For instance, species with a greater expression of the “sword” may also have increased size of hearts and gills, which would allow for more oxygen intake in the circulatory system potentially offsetting the locomotor burden of the “sword”. The purpose of this research was to examine the relationship between sword lengths and heart and gill mass among males from species within Xiphophorus. Hearts and gills were dissected out from preserved males and weighed to the nearest 0.00001 g. The mass of these organs was then compared among species that vary in sword length. Here we present initial findings from ~10 species within the genus that vary in their expression of the trait.
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