ISCAP

Independent Scholarship and Creative Activities Presentations

Program
Wednesday, May 2, 2012
May 2, 2012

Dear Students, Scholars, Faculty and Families,

Today the Rider University community will hear about the remarkable scholarship, research, and creative endeavors of our students as they apply their college education in innovative ways.

To those students who are presenting their work today, I extend congratulations on your achievements. To all those who supported these students in their academic adventures, I offer appreciation and thanks. These activities exemplify the many valuable opportunities and resources students enjoy at Rider to enrich their learning experience. Frankly, our students could not have done their work without you.

Special congratulations to this year's Undergraduate Research and Scholarship Award winners. These students proposed detailed independent projects to be carried out in the following academic year and will each receive a $5,000 tuition scholarship. You will hear about the wide variety of projects they will be undertaking in the awards session later this afternoon.

Whether you conducted research or helped to make it happen, your efforts send a strong message about the academic excellence students can achieve at Rider. Congratulations to everyone involved!

Sincerely,

Mordechai Rozanski
May 2, 2012

Dear Students, Faculty, and Family Members,

Today is a full day dedicated to honoring and showcasing the creative works and research of Rider University students in collaboration with their faculty mentors. Each year, the Undergraduate Research Scholar Awards (URSA) Committee hosts ISCAP (Independent Scholarship & Creative Activities Presentation) Day in an effort to display student originality and contributions to their fields of interest. ISCAP Day is also meant as a forum for members of the Rider community—both faculty and students—to come together in an interdisciplinary dialogue focused on students’ creative projects.

Another very important purpose for ISCAP Day is to announce new URSA scholarship recipients, as well as to hear about the progress made among last year’s URSA award winners on their year-long projects. This portion of the day is particularly important as we honor some of the most gifted undergraduates at Rider. We congratulate you on your monumental accomplishment.

Please join us as we celebrate these student achievements and honor their creative works. Congratulations on a job well done!

Sincerely,

[Signature]

Donald A. Steven
Provost and Vice President for Academic Affairs
ISCAP Day
Wednesday, May 2, 2012
Sweigart Hall
9:50 AM – 4:00 PM

9:30-11:00  Breakfast:  Sweigart Atrium

9:50-10:00  Introduction:  Sweigart Auditorium (SWE 115)
Dr. Donald A. Steven

10:00-12:30  URSA Awards Session:  Sweigart Auditorium (SWE 115)
Session Chair:  Dr. Brooke Hunter

12:30-1:45  Poster Session & Lunch:  Sweigart Atrium
Session Chair:  Dr. Tracey Garrett

1:45-2:45  Panel Presentations Session I:  Sweigart 110, 117, 118

2:45-4:00  Coffee Break:  Sweigart Atrium

3:00-4:00  Panel Presentations Session II:  Sweigart 117, 118
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<tr>
<th>Time</th>
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<tr>
<td>9:50</td>
<td>Introduction</td>
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| 10:00-10:30 | Post-Soviet Societies                      | Naomi Vernon, Musical Theater and Arts Administration (WCA), 2012-2013  
*The Frozen Curtain: Expanding Arts Business in the Former Eastern Bloc*  
Advisor: Dr. Todd Dellinger  
Jennifer Sorensen, History (CLAES), 2011-2012  
*New Currents of Fascism: Neo-Nazism in the Russian Federation*  
Advisor: Dr. Lucien Frary |
| 10:30-11:00 | Identity and the Arts                     | Jessica Canose, Spanish (CLAES), 2012-2013  
*Entangled in a Web of Hollywood Dreams: Unearthing the Subtext of Homosexuality in the Works of Manuel Puig*  
Advisor: Dr. Hernán Fontanet  
Aubrey Maks, Music Education & Music Composition, History & Theory (WCA), 2011-2012  
*The Significance of Maori Culture in the World of Popular Music*  
Advisor: Dr. Eric Hung |
| 11:00-11:30 | Scholarship of Teaching and Learning    | Michael Zubert, Music Education (WCA), 2012-2013  
*Using Digital Audio Workstations to Enhance Learning in High School Music Education Classrooms*  
Advisor: Dr. Janet Cape  
Nicole Singer, Education & English (CLAES), 2011-2012  
*The Impact of Leadership Training on Pre-service Teachers: A One Year Study of Teacher Leadership*  
Advisor: Dr. Kathleen Pierce |
| 11:30-12:00 | Advances in Biological Research         | Thomas Vajtay, Biology (CLAES), 2012-2013  
*Strain Specific Variation in the Innervation and Integration of the Optic Nerve in the Suprachiasmatic Nuclei of Mice*  
Advisor: Dr. Todd Weber  
Amanda Walker, Biology (CLAES), 2011-2012  
*The Relationship of Intestinal Microbiota Composition to Immune Function in Wild-type and Immune Molecule Knockout Mouse Strains*  
Advisors: Dr. Kelly Bidle & Dr. James Riggs |
12:00-12:30  From George Washington’s Woods to the Federal Deficit

Allison Ingram, Environmental Sciences (CLAES), 2012-2013
Factors controlling growth rates of oaks, tulip poplars and beech, across George Washington's Mount Vernon plantation in Virginia
Advisor: Dr. Daniel Druckenbrod

Brian Blanda, Economics (CBA), 2011-2012
The Effects of United States Deficit and Debt on the Country’s GDP
Advisor: Dr. Kelly Noonan

Poster Session
Sweigart Atrium
12:30-1:45

1. Kristin Anderson & Shane Fitzgerald (Dr. Todd Weber): The Effects of Chemotherapy on Neurogenesis in Old Age Mice
2. Nasrini Azrolan & Jad Brian (Dr. Todd Weber): Comparison of the Ability to Resist Jetlag in Mouse Strains Genetically Similar to The Jetlag-Less BALB/Cj Strain
3. Caroline Baptist (Dr. Gabriela Smalley): Macroalgae Preference for The Purple Sea Urchin, Arbacia Punctulata
4. Jade Bing (Dr. Danielle Jacobs): Employment of SuperQuat Chiral Auxiliaries Toward the Novel Asymmetric Synthesis of Majorenolide and Majorynolide
5. Nicole Chakowski (Dr. Daniel Druckenbrod): Did Jefferson Plant the Two Tulip Poplars (Liriodendron tulipifera) Adjacent to His House?
6. Melanie Chase (Dr. Chrystina Dolyniuk): An Exploration of How College Students Use Technology to Communicate
7. Anna Cymerman (Dr. Bryan Spiegelberg): Relocation of Gβγ with sphingosine 1-phosphate receptor 1 to the nucleus after cellular stimulation
8. Kathryn Faugno (Dr. Phillip Lowrey): Functional Analysis of Mutations in Mammalian CKIε
9. Sara Harrison-Lusk (Dr. Todd Weber): The Combined Effects of Exercise and Fluoxetine on Chemotherapy Mediated Inhibition of Hippocampal Neurogenesis in C57BL/6J Male Mice
10. Sarah Homan (Dr. James Riggs): Monitoring Expression of Pro-Angiogenic Receptors in a Model of the Tumor Microenvironment
11. Jessica Horton (Dr. Paul Jivoff): Factors that Influence the Righting Behavior of Starfish
12. Allison Ingram (Dr. Dan Druckenbord): Factors controlling growth rates of chestnut oak and white oak across George Washington's Mount Vernon plantation in Virginia
13. Nina Joffe (Dr. Julie Drawbridge): Phylogenetic Analysis of Oophila Ambystomatidis
14. Laura Jones (Dr. Bruce Burnham): Synthesis of C-Nucleosides and N-Nucleosides as anticancer and antiviral drugs
15. Aaron Lattin (Dr. Bryan Spiegelberg): In-vitro Oxidation of LDL from Chicken Eggs
16. **Nicholas Mazza** (Dr. Hongbing Sun): Hydrogeological Characteristics of the Duck Island Landfill in Trenton, New Jersey and its Relationship to Volatile Chemicals

17. **Erin McCafferty & Thaiphi Luu** (Dr. Julie Drawbridge): A Role for GDNF in Pronephric Duct Cell Migration in *Xenopus laevis*

18. **Shannon Melick** (Dr. Paul Jivoff): Effect of Size on Habitat Preference and Agonistic Behavior in Crayfish

19. **Zachary Orr** (Dr. Bruce Burnham): Synthesis of C5 Nucleoside Pyrroles

20. **Christine Sookhdeo** (Dr. Daniel Druckenbrod): Analysis of Properties of Post-Agricultural Soils, Lawrenceville, New Jersey

21. **Matthew Springer & Elizabeth Tkaczynski** (Dr. Julie Drawbridge): *Ambystoma maculatum* and *Oophila ambystomatis*: A Proposed Model System for Investigating Oxygen Sensing during Vertebrate Development

22. **Thomas Vajtay** (Dr. Todd Weber): Characterizing Strain Specific Variation in Clock Resetting Behavior

23. **Amanda Young** (Dr. Gabriela Smalley): Sea Urchin Larval Development and Metamorphosis

24. **Zachary Orr** (Dr. Bruce Burnham): Synthesis of C5 Nucleoside Pyrroles

Panel Presentations

**Session I**

1:45-2:45

**Panel A: Research on children and adolescents: Trends in Development and treatment**

**Location:** Sweigart 110

**Chair:** Dr. Tracey Garrett (URSA Committee, Department of Teacher Education)

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<tr>
<td>1:45</td>
<td>Michelle Wall</td>
<td>“Nonverbal communication comprehension among individuals with developmental disabilities” Advisor: Dr. Michael Carlin</td>
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<tr>
<td>2:05</td>
<td>Alexandra Lipari</td>
<td>“Struggling to breathe: Racial disparity in pediatric asthma care in New Jersey” Advisor: Dr. Hope Corman</td>
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Panel B: Evolution and perspectives in science and the arts
Location: Sweigart 117
Chair: Dr. Jerry Rife (URSA Committee, Department of Fine Arts)

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<tr>
<td>1:45</td>
<td>Yuliya Labko</td>
<td>“Effect of varying Alliaria petiolata populations on myrosinase and sinigrin concentration in soil” Advisor: Dr. Laura Hyatt</td>
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<td>2:05</td>
<td>Debra Ratner</td>
<td>“Poetry en Francais” Advisor: Dr. Mary Poteau-Tralie</td>
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<td>2:25</td>
<td>Samantha Belivakici</td>
<td>“The human figure” Advisor: Dr. Deborah Rosenthal</td>
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Panel C: Movements toward Change
Location: Sweigart 118
Chair: Dr. Dianne Garyantes (URSA Committee, Department of Communication)

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<tr>
<td>1:45</td>
<td>Jessica Scanlon</td>
<td>“Two Women in Early 20th Century American Public Relations” Advisor: Dr. Pamela Brown</td>
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<tr>
<td>2:05</td>
<td>Hannah Taylor</td>
<td>“A Return to Ideology: an analysis of the Tea Party movement and its effects on American political party dynamics” Advisor: Dr. Michael Brogan</td>
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<td>2:25</td>
<td>Lauren Clabaugh</td>
<td>Rider University Parking Lot Lighting Grant Proposal Advisor: Dr. Mary Morse</td>
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Panel Presentations
Session II
3:00-4:00

Panel D: Conflict, friendship, and creation: The cultural influence of literature
Location: Sweigart 117
Chair: Dr. Karen L. Gischlar (URSA Committee, Department of Graduate Education)

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<th>Time</th>
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<tr>
<td>3:00</td>
<td>Zachary Bragg</td>
<td>“Myth, exchange and The Great Divorce” Advisor: Dr. Vanita Neelakanta</td>
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<tr>
<td>3:20</td>
<td>Tess Ammerman, Richard Busch, Christie Carrera &amp; Lauren Ashley Wood</td>
<td>“Merlin: Behind the magic” Advisor: Dr. Mary Morse</td>
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Panel E: Perspectives from the Frontline: The Effects of War and Military Life  
Location: Sweigart 118  
Chair: Dr. Brooke Hunter (URSA Committee, Department of History)

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<tr>
<td>3:00</td>
<td>Tara Taylor</td>
<td>“Charlie Mike: Heroes in the Alley, Veterans and the Organizations that Serve Them” Advisor: Professor Richard Zdan</td>
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<tr>
<td>3:20</td>
<td>Claire Beesley</td>
<td>“POWs’ Oral Histories” Advisor: Dr. Thomas Callahan</td>
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<tr>
<td>3:40</td>
<td>Lauren Runza</td>
<td>“The Enemy in the Garden State: Japanese Americans in New Jersey During World War II” Advisor: Dr. Thomas Callahan</td>
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ABSTRACTS FOR STUDENT PRESENTATIONS

Tess Ammerman, Richard Busch, Christie Carrera & Lauren Ashley Wood
Title: Merlin: Behind the magic  
Advisor: Dr. Mary Morse  
Abstract: The four of us retold the story of Merlin in a humorous story of love, honor, the power of friendship and our text in class. We explored the characters of Merlin, Arthur, Nimue, Guinevere, and the common link that held them all together. PNL

Kristin Anderson & Shane Fitzgerald
Advisor: Dr. Todd Weber  
Title: The Effects of Chemotherapy on Neurogenesis in Old Age Mice  
Abstract: “Chemo brain” is a spectrum of cognitive and affective disorders that occurs after treatment with chemotherapy and has a long lasting persistence. Previous research we have performed has looked at the mechanism behind “chemo brain” in young mice in which deficits are readily apparent. We have shown a decreased proliferation of neurons in the dentate gyrus of the hippocampus weeks after chemotherapy treatment along with persistent behavioral deficits (anxiety and depression related behaviors along with memory impairment). Although this research may correlate to young cancer patients, the bulk of cancer patients are adults, which have different brain physiology and cognitive abilities. Therefore, we propose to study the effects of chemotherapy in aged mice to complement our current research. PSTR
Nasrini Azrolan & Jad Brian
Advisor: Dr. Todd Weber
Title: Comparison of the Ability to Resist Jetlag in Mouse Strains Genetically Similar to The Jetlag-Less BALB/cj Strain
Abstract: Jetlag is caused by the period of time necessary for the biological clock to adjust to a significant shift in the light/dark cycle. Previous experiments in our lab have shown that mice from the BALB/cJ strain show an increased capacity to adjust rapidly to a new cycle. This allows them to significantly reduce jetlag effects on wheel running activity over those measured in the common strain C57BL/6. Based on the genetic profiles of several strains of mice, we hypothesized that C3H/HeJ and 129/s1 mouse strains would exhibit similar abilities to BALB/cJ’s in adjusting to shifts in the cycle, while A/J and DBA/2J strains were expected to exhibit the ability to adjust at an intermediate rate. Mice from all 4 strains were exposed to light/dark cycle manipulations identical to those performed on the original strains, including a 6-hour phase advance, release to constant darkness, and 1-hour light pulses at both ends of the established 12-hour light period. Results show that none of the strains examined consistently replicated the ability of BALB/cJ mice to adjust rapidly. We concluded that different genetic components than those examined are responsible for the ability to resist jetlag, with future studies planned to examine those factors. PSTR

Caroline Baptist
Advisor: Dr. Gabriela Smalley
Title: Macroalgae Preference for The Purple Sea Urchin, Arbacia Punctulata
Abstract: The purple sea urchin, Arbacia punctulata, is native to Florida and is an aggressive grazer of macroalgae. This study looks at variation in consumption of different species of macroalgae. Macroalgae preference was tested using live and dried algae from New Jersey and Florida. The Florida species include Sargassum filipedulum, Codium decorticatum and Fucus sp; the two New Jersey species were Ulva lactuca and Ascophyllum nodosum. Dried algae were tested by mixing the dried algae with agar and spreading the mixture on window screening. For each feeding assay, the urchins were given two different species algae to determine feeding preferences. Habitat preference was also studied, testing three different habitats: sand, gravel and shells. The urchins did not show a habitat preference; most often they were observed on the walls of the tank and usually in a corner. This behavior is most likely due to the need to escape predators such as large fish. This study may give further insight to the effect of Arbacia punctulata grazing on macroalgae abundance and diversity in the field. PSTR

Claire Beesley
Advisor: Dr. Thomas Callahan
Title: POWs’ Oral Histories
Abstract: My senior thesis focused on the prisoner of war experiences of Arthur Gentile, Herman Frank, and Ellis “Norman” Beesley. They shared their stories with the Center of U.S War Veterans’ Oral History Project at the National Guard Militia Museum in Sea Girt, New Jersey. The interviews were recorded and saved in the NGMM and also sent to the Library of Congress for the Veterans’ History Project. The interviews provide a vivid portrayal of their individual journeys as a prisoner of war in Nazi Germany. Gentile, Frank, and Beesley all interacted with various German soldiers during their capture, interrogation, life in the camp, and during a
forced march. Their interviews provide first-hand accounts of the treatment by German soldiers. Arthur Gentile discussed extreme torture shortly after his capture but was saved by an on looking German officer. Herman Frank recalled a strict interrogation followed by days of solitary confinement. In addition, he provided an interesting insight as a Jewish prisoner of war. Norman Beesley was involved with escape attempts and consequences within Oflag 64, Stalag Luft III and on a forced march. I used the Geneva Convention of 1929 to analyze the treatment of the prisoners by German soldiers. PNL

Samantha Belivakici
Advisor: Dr. Deborah Rosenthal
Title: The human figure
Abstract: Since Ancient Greece artists have been obsessed with the human form and translating its magnificent natural details into works of art. Over the past semester I have been researching the human figure from sculptor and painting reproductions, clothed and nude models, and everyday people. In my works I use mediums such as oil paint, charcoal, and pencil. It is a never ending learning process of simply appreciating the shape and proportions of the body, in various poses and natural movements. It takes true understanding of not just how a figure is shaped, but what structures underneath the flesh makes up the concavities and convexities of the body. Figure drawing also involves the implication of sexual tension or attraction, physical strength, and most importantly human mentality and psychology. PNL

Brian Blanda
Advisor: Dr. Kelly Noonan
Title: The Effects of United States Deficit & Debt on the Country’s GDP
Abstract: From December 2007 to October 2009, government deficits rose from $340.2 billion to $1.6 trillion, gross government debt rose 28% to reach $14.56 trillion, and GDP-to-debt ratio rose 20%. The purpose of this research is to understand the implications that the United States’ continuous federal deficit and debt have on the stability and growth of the nation’s GDP (Gross Domestic Product). Specifically, the research will focus on the inherent economic impact that exists with a federal deficit and debt. This will involve a historical analysis of United States’ federal deficit and debt. Given our findings, we have concluded that the percent of debt change has a negative effect on real GDP change. For every 1% increase in debt change, real GDP change decreases by 0.48%. Also we have consistent results with Reinhart and Rogoff that the debt/GDP ratio also has a negative effect on real GDP change once debt/GDP reaches above 90%. We have also concluded that, as well as debt change having a negative effect on real GDP change on its own, debt change is also an avenue which other economic factors can effect real GDP change. This research is meant to provide valid, contemporary data to be used in future policies in order to understand and properly correct the adverse effects of a country’s continuous federal deficit and debt. URSA 2011-2012

Jade Bing
Advisor: Dr. Danielle Jacobs
Title: Employment of SuperQuat Chiral Auxiliaries Toward the Novel Asymmetric Synthesis of Majorenolide and Majoryrnolide
Abstract: Our laboratory is focused on the novel asymmetric total synthesis of majorenolide
and majorynolide, two natural products exhibiting cytotoxic activities in human tumor cells. The investigation of the ability of SuperQuat chiral auxiliaries to affect stereoselectivity in asymmetric glycolate alkylations with methyliodoacrylates serves as the preliminary step in the preparation of these targets. Previous investigations in our laboratory on such alkylations of (S)-p-methoxybenzylglycolyl-i-propyl-2-oxazolidinone provided at best 75:25 diastereoselectivity using t-butyl- and i-butyl-2-(methyliodo)acrylates as electrophiles. We envision that the innovative application of SuperQuat chiral auxiliaries with increased steric hindrance will heighten the rigidity of the alkylation transition state, thereby improving diastereoselectivity. SuperQuat chiral auxiliaries (S)-5,5-diphenyl-4-isopropylxoxazolidin-2-one and (S)-5,5- dimethyl-4-isopropylxoxazolidin-2-one were thus appended to benzyloxyacetyl chloride providing their respective (S)-glycolyloxazolidinones. Subsequent glycolate alkylation with sterically congested methyliodoacrylates is expected to provide highly stereo- and regioselective products. Upon optimization of an alkylation protocol, further lactonization, olefin metathesis and protecting group removal should streamline the syntheses of majorenolide and majorynolide. PSTR

Zachary Bragg
Advisor: Dr. Vanita Neelakanta
Title: Myth, exchange and The Great Divorce
Abstract: Throughout history and in our current society, there is growing opposition among intellectual beliefs and values. For example, when we consider the competitive nature of politics or the diversity of religious beliefs in our modern world, it is evident that humans push further away from each other as they continue to disagree. Can there be reconciliation between social ideas that contradict one another? What French Anthropologist Claude-Levi Strauss suggests is that in terms of literature, myth is a useful medium for focusing readers’ attention on the popular beliefs within society that are in disagreement. While in reality these ideas may very likely oppose each other, the myth serves as an agent for mediation between them by emphasizing their exchange. Historically speaking, this concept derives from how the individual identity is challenged in the exchange of goods and the union of marriage. Aware of this social phenomenon, Educator, profound Essayist and major Christian thinker C.S. Lewis engages readers with a narrative that is concerned with the idea of mediation through the exchange of dialogue, identity, and ultimately one’s soul. Strauss’s theory of mediation through exchange can be applied to the fantasy world of Lewis discovered in his piece The Great Divorce. PNL

Jessica Canose
Advisor: Dr. Hernán Fontanet
Title: "Entangled in a Web of Hollywood Dreams: Unearthing the Subtext of Homosexuality in the Works of Manuel Puig"
Abstract: This project is a continuation of an Honor’s contract—to be presented in two colloquiums—that explores how homosexual individuals are silenced during times of oppression, as portrayed in Manuel Puig’s iconic film, El beso de la mujer araña (Kiss of the Spiderwoman). Continuing as my Spanish Senior thesis, I will examine the portrayal and psyche of the repressed homosexual individual in Latin America, by investigating the psychological methods of coping with social boundaries. I will primarily focus upon Puig’s escape strategy,
wherein protagonists use Hollywood movies as their escape to fantasy, as they live vicariously through female movie stars.  **URSA 2012-2013**

**Nicole Chakowski**  
**Advisor:** Dr. Daniel Druckenbrod  
**Title:** Did Jefferson Plant the Two Tulip Poplars (Liriodendron tulipifera) Adjacent to His House?  
**Abstract:** Until recently, two large tulip poplar trees (Liriodendron tulipifera) grew adjacent to Thomas Jefferson’s Monticello home. These trees were removed because of concerns that they could damage the house if they fell; however, it is uncertain as to whether these trees were planted by Thomas Jefferson. Jefferson’s writings suggest that he may have planted both tulip poplars. This study used standard dendrochronological techniques to determine the age of both trees. After the rings were counted they were measured using Velmex TA System. Other tulip poplars from the Monticello area were used as a comparison for the two poplars using skeleton plots. A statistical program was used to compare the ring-width patterns from the local poplar chronology as well as a local oak chronology to the two poplars to further support the skeleton plot results. Cross dating the two poplars with the trees in the surrounding area showed that the tree on the North side was indeed a Jefferson era tree while the tree on the South side was inconclusive—because the section of the south tree that was dated from an upper branch. Using estimates of regional poplar growth rates, the south tree may also have been Jefferson-era. **PSTR**

**Melanie Chase**  
**Advisor:** Dr. Chrystina Dolyniuk  
**Title:** An Exploration of How College Students Use Technology to Communicate  
**Abstract:** The purpose of this study was to examine how college students use technology; specifically text messaging and Facebook. The participants of this study were college students (N=98) who completed a survey on demographics, learning styles, frequency and quality of technological use. In total, 15 students reported a disability, 3 students reported an autism spectrum disorder, and 20 students suggested they had some condition that affects learning. Additionally, 5 students indicate that they may have social difficulties; 9 students indicated that they may have communication difficulties, and 23 students stated they may have behavioral difficulties. Each of these characteristics was targeted as literature suggests they may have implications for both technology use and long term outcome. Preliminary data analysis suggests that a deeper examination of individual characteristics and learning styles, as well as they how they affect technology use is warranted. **PSTR**

**Lauren Clabaugh**  
**Advisor:** Dr. Mary Morse  
**Title:** Rider University Parking Lot Lighting Grant Proposal  
**Abstract:** The mission of the Office of Sustainability and the Environmental and Sustainability Steering Committee (ESSC) is to lead Rider University in Lawrenceville, NJ to complete environmental sustainability. We are pushing forward with the renovation of the South Parking Lot lighting system for reasons of energy efficiency, cost effectiveness, and increased safety.
We are requesting assistance in funding this project through a grant from your organization. The total estimate for this project is $381,000. This estimate was obtained from Kubiak Electric Co., Inc. a local contractor based in Robbinsville, NJ. All parts and labor for the project would be supplied by Kubiak. Installation would be completed over a summer recess between academic years to avoid complications with occupying the most used on-campus parking lot. The new system will provide a 57% reduction in energy use and cost. PNL

Anna Cymerman
Advisor: Dr. Bryan Speigelberg
Title: Relocation of Gβγ with sphingosine 1-phosphate receptor 1 to the nucleus after cellular stimulation
Abstract: Emerging data implicate G protein-coupled receptors in direct signaling throughout the cell, including the nucleus. For example, sphingosine-1-phosphate receptor 1 (S1P₁) is internalized to the nucleus after stimulation in several cell types, and signaling through the nuclearized receptor has been shown to influence gene transcription. To further characterize such nuclear GPCR signaling, we have focused on understanding roles for heterotrimeric G proteins within the nucleus. Specifically, we propose that Gβγ activated by nuclearized Gi-coupled GPCRs may influence gene function in part through the direct regulation of specific histone acetylases and deacetylases. Here, we used biochemistry and epifluorescent and confocal microscopy to show that Gβ relocates to the nucleus with GFP-tagged S1P₁ upon stimulation of HEK293 cells with S1P. Characterization of the cellular dynamics of heterotrimeric G proteins will facilitate further studies of the direct regulation of transcriptional co-activators and repressors by activated Gβγ in the nucleus. PSTR

Kathryn Faugno
Advisor: Dr. Phillip Lowrey
Title: Functional Analysis of Mutations in Mammalian CKIε
Abstract: Common to many life forms on Earth are endogenous biological clocks which produce daily (circadian) rhythms in biochemistry, physiology and behavior. These clocks are synchronized to the environment by time cues including the 24-hr light/dark cycle. In mammalian cells, the enzyme casein kinase I epsilon (CKIε) is a major component of the circadian clock. Previously in our laboratory, an error-prone PCR technique was used to randomly mutagenize a full-length CKIε cDNA clone (1,245 bp) at an average rate of one nucleotide change per amplified cDNA. The resulting PCR products were cloned into the pEXP5-CT E. coli expression vector. In this study, wild-type and six mutant CKIε cDNA clones coding for single amino acid substitutions were transformed into BL21 STAR E. coli cells and selected on carbenicillin/chloramphenicol-containing LB plates. Expression of wild-type and mutant CKIε cDNA was performed in 96-well plates followed by affinity purification. A luminometry-based kinase assay was used to screen the CKIε mutants for functional changes. Compared to wild-type, we observed no change in kinase activity for mutant A30U, and decreased activity in mutants R178C, I406U, W213R, Y251H and G75D. Additional work may reveal novel regions of the CKIε enzyme that play an important role in its function. PSTR

Sara Harrison-Lusk
Advisor: Dr. Todd Weber
**Title:** Functional Analysis of Mutations in Mammalian CKIε

**Abstract:** Chemotherapy drugs such as thioTEPA have been known to impact a number of physiological functions such as neurogenesis, the generation of new cells in the brain, although mechanisms have not been identified. This phenomenon is limited to a certain number of areas in the brain including the dentate gyrus of the hippocampus. Independently, both short-term exercise and the antidepressant fluoxetine (Prozac) have been documented to increase the rate of cell proliferation in the dentate gyrus. In my project, I examined the interaction between fluoxetine and exercise on chemotherapy-mediated inhibition of neurogenesis. Male C57BL/6J mice were administered a three day regimen of ThioTEPA or a vehicle treatment. Six weeks after chemotherapy treatment, mice were subjected to fluoxetine, exercise, both or neither for 1-2 week, at which time newborn cells in the dentate gyrus were quantified. Preliminary data suggest that after chemotherapy administration, mice that were allowed to exercise exhibited up-regulated hippocampal cell proliferation compared to the controls. While antidepressant treated mice appeared to exhibit down-regulated hippocampal cell proliferation.

Sarah Homan  
**Advisor:** Dr. James Riggs

**Title:** Monitoring Expression of Pro-Angiogenic Receptors in a Model of the Tumor Microenvironment

**Abstract:** Tumor growth requires angiogenesis, the recruitment of blood vessels to deliver oxygen to the evolving mass of tumor cells. Molecules such as vascular endothelial growth factor (VEGF), angiopoietin (ANG), and erythropoietin (EPO) aid in this process. We are interested in understanding the role of immune cells in this environment. In a culture system that reproduces key features of the tumor microenvironment, we have found that macrophages suppress the T cell response needed to combat the tumor cells. We found that EPO, VEGF, and ANG increase T cell suppression in our model. My current research examines which immune cells express receptors for these angiogenesis-promoting hormones. I have found that distinct subsets of T cells and B cells express specific receptors for these molecules. These observations could inform strategies designed to slow tumor progression.

Jessica Horton  
**Advisor:** Dr. Paul Jivoff

**Title:** Factors that Influence the Righting Behavior of Starfish

**Abstract:** The righting of starfish has important implications in the survival of the organism. How fast the organism can right itself in different situations could mean life or death. The three starfish species used in this study were *Echinaster spinulosis, Luidia clathrata, and Astropecten articulatus*. The factors studied in this experiment were the righting times on three different substrates, predator presence, and if righting has any effects on the respiratory function of the organism. The righting time was observed on three substrates: sand, mud, and gravel. The predator presence was conducted using *Odonus niger* as the predator and recording the righting time of the starfish when the predator was present or absent. The final test in this experiment was the effects on the respiratory functions of the starfish. The righting times on the three substrates varied between the substrates but did not vary between the species. However the size was a significant covariate in the ANOVA test. The righting times when studying the presence of a predator were shorter than when the predator was absent. The
study involving the respiratory functions showed the respiratory function is restricted when flipped. In conclusion, there are many factors that influence the righting of starfish. PSTR

Allison Ingram
Advisor: Dr. Dan Druckenbrod
Title: "Factors controlling growth rates of oaks, tulip poplars and beech, across George Washington's Mount Vernon plantation in Virginia"
Abstract: This study will use tree-ring measurements and GIS maps to examine relationships between growth rates and basal areas, and topographic wetness index (TWI) and aspect for oaks, poplars and beech across the property on George Washington’s Mount Vernon plantation. The objectives are to determine whether growth rates and basal areas across the site are influenced by TWI and aspect and if these species respond equally to a moisture gradient. This project expands on research I conducted since my freshman year at Rider and will lead to the completion of a manuscript that I will submit to a peer-reviewed research journal. URSA 2012-2013

Advisor: Dr. Dan Druckenbrod
Title: Factors controlling growth rates of chestnut oak and white oak across George Washington's Mount Vernon plantation in Virginia
Abstract: This study used cross-dated and measured tree-ring data and GIS maps to examine relationships between growth rates and basal areas, and topographic wetness index (TWI) and aspect for two oak species, white oak, (Quercus alba L.) and chestnut oak, (Quercus prinus L.), across the property on George Washington’s Mount Vernon plantation in Virginia. The objective was to determine variation in growth rates and basal areas across the site as influenced by TWI and aspect. Dominant and co-dominant oaks were cored, cross-dated and measured and growth rates were determined using the years 2000 to 2004. This study found that growth rate is constrained by TWI in oak species. In white oak, growth rates increase with increasing TWI and in chestnut oak, growth rates decrease with increasing TWI. These growth responses are supported by studies that examine the growth of oaks across moisture gradients and likely reflect species specific adaptations to soil moisture availability. Basal area for both species shows the same trend along the moisture gradient. White oaks grow on sites with a different mean TWI than chestnut oaks. The effect of aspect on growth rate and basal area was not significant. PSTR

Nina Joffe
Advisor: Dr. Julie Drawbridge
Title: Phylogenetic Analysis of Oophila Ambystomatis
Abstract: The single celled chlamydomonad alga, Oophila ambystomatis, lives inside the egg capsule of spotted salamander embryos Ambystoma maculatum. Studies suggest that the relationship between the two organisms is symbiotic; the alga provides developing embryos with oxygen, the embryos may provide a source of nitrogen for the alga. This study uses analysis of 18S ribosomal, 23S ribosomal, the large subunit of ribulose-bisphosphate carboxylase, and ATPase beta-subunit genes, and molecular phylogenetic methods to understand if the algae found in Rider populations is the same species of algae found in other
A. maculatum eggs in other North American regions, and determine how O. ambystomatis is related to other chlamydomonad algae. Molecular phylogenetic analysis indicates that the O. ambystomatis found on Rider campus is the same species as the symbiotic algae found in other North American regions. Analysis has also revealed that it is highly likely that O. ambystomatis is a strain of the species Chlamydomonas psudeogloeogama. PSTR

Laura Jones
Advisor: Dr. Bruce Burnham
Title: Synthesis of C-Nucleosides and N-Nucleosides as anticancer and antiviral drugs
Abstract: The purpose of this research was to synthesize C-Nucleosides and N-Nucleosides for their potential use as antiviral and anticancer drugs. The project had two goals: 1) making the drugs candidates themselves, 2) the optimization of the intermediate steps. The C-Nucleosides and N-Nucleosides were made via a series of syntheses beginning with a chloroacetophenone which was made into a β-ketoester and then synthesized to a β-chloroenal. Once the β-ketoester was confirmed via H-NMR, a vinylogous amide was then synthesized and confirmed via H-NMR, IR and C-NMR that the desired product was synthesized. A separate synthesis was also done to produce an α-aminoketone, the carbon-nitrogen synthon, from the α-bromoacetophenone in 2 steps. The two separate products were combined to synthesize the pyrrole, which was confirmed via H-NMR, IR, GC and C-NMR. The pyrrole was used as the starting point for the synthesis of the pyrrole N-nucleoside and synthesis of the pyrrole C-nucleoside. The final products, C-Nucleosides and N-nucleosides, were confirmed via the series of conformational tests such as C-NMR, H-NMR, IR and GC. This research was done in collaboration with Dr. Byrd of Western Carolina University who will perform a bioassay on the obtained nucleosides. PSTR

Yuliya Labko
Advisor: Dr. Laura Hyatt
Title: Effect of varying Alliaria petiolata populations on myrosinase and sinigrin concentration in soil
Abstract: Alliaria petiolata is an exotic, invasive plant species that has been invading North American forest understories since the early 20th century. Recent research has suggested that chemical exudates from A. petiolata in the soil suppress the fungal symbionts involved in mycorrhizae. This allelopathic behavior suppresses native plants, enhances invasion success, and may have cascading effects on the soil microbiome. Because it is a biennial, populations of A. petiolata often alternate between juvenile and adult-only demographic structures. Because individuals are known to alter their chemical profiles with age, we wondered whether these alternating population structures are associated with soil chemistry patterns, and if they change throughout the growing season. We developed and applied assays for sinigrin, a glucosinolate compound, and myrosinase, a common soil enzyme, also made by A. petiolata that degrades sinigrin. The isothiocyanate that results from sinigrin’s breakdown is what negatively impacts the growth and survival of neighboring, indigenous plants through inhibiting mycorrhizal relationships. We also assessed the diversity native microbial communities in areas with the invader. The results of these assays have important implications for explaining the extent of and options for control for A. petiolata invasions. PNL
Aaron Lattin
Advisor: Dr. Bryan Spiegelberg
Title: In-vitro Oxidation of LDL from Chicken Eggs
Abstract: Low-density lipoproteins are a health risk; oxidized LDL is converted to atherosclerotic plaques in the bloodstream. Anti oxidants may have health benefits by slowing the oxidative process. Further in vitro studies may clarify mechanisms by which oxidation occurs. Chicken egg LDL has been used as a cheaper, more consistent substitute for human serum LDL in these Assays. Copper(II) was used to catalyze the oxidation, and lipid peroxidation was quantified via colorimetric TBARS assays. Copper(II) was found to oxidize chicken LDL in a dose-dependent manner with an IC$_{50}$ of 6.5 uM. Chicken egg LDL has been found to be an effective substrate for these assays. Further research will address the effects of known antioxidants Vitamin E and BHT. PSTR

Alexandra Lipari
Advisor: Dr. Hope Corman
Title: Struggling to breathe: Racial disparity in pediatric asthma care in New Jersey
Abstract: This is an econometric research study conducted with New Jersey State Medicaid claims data holding information for children from ages 0-12 that have filed over 20 million claims in the year of 2009. Utilizing these claims, a study was conducted examining the social disparity in treatment of asthma in New Jersey for pediatrics with special consideration taken to the differences between African Americans and Whites. The proven hypothesis shows that African Americans are less likely to receive care from a doctor, and therefore pursue emergency care from the ER. This mismanagement of care for African Americans must be looked at in a more in depth fashion in the future. PNL

Aubrey Maks
Advisor: Dr. Eric Hung
Title: The Significance of Maori Culture in the World of Popular Music
Abstract: This project examines the significance of popular Maori music and how it is relevant today. Questions I intend to focus on are: How do Maori popular musicians use traditional Maori music? How does Maori popular music promote the preservation of Maori cultural identity? How do Maori popular musicians portray Maori history and Maori life today? What musical elements of Maori popular music are similar to those in American popular music and other world music? I intend to research Maori history, rhetoric, language, instruments, and traditional style to answer these questions about today’s Maori popular music. URSA 2011-2012

Nicholas Mazza
Advisor: Dr. Hongbing Sun
Title: Hydrogeological Characteristics of the Duck Island Landfill in Trenton, New Jersey and its Relationship to Volatile Chemicals
Abstract: This study examined the hydrogeological and geochemical aspects of the landfill in Trenton, NJ. By examining the water level change and conducting groundwater slug tests in multiple monitoring wells, we obtained the hydraulic gradient and groundwater flow velocity of the area. By measuring the metal concentrations of the water samples from those wells (~15
wells) using ICP, we identified the well spots where concentrations of toxic metals, such as Pb and As, are above the EPA's maximum contamination level. The hydrological parameters, metal concentration measured in the wells, and soil mineral modal abundance obtained on the site helped us obtain the flow rate of heavy metals and other contaminants in groundwater. Based on our estimation of the flow rate, it takes about 20 years for those metals (including heavy metals such as Pb and As) to move from the landfill site to the Delaware River if leaks occur in the landfill. The Delaware River is where both the NJ American Water Company and the Philadelphia Water Company take up water for public use. Our study also noticed that significant land subsidence occurred over the last 10 years on the landfill site based on the water level data we collected. PSTR

Erin McCafferty & Thaiphi Luu
Advisor: Dr. Julie Drawbridge
Title: A Role for GDNF in Pronephric Duct Cell Migration in Xenopus laevis
Abstract: Anterior to posterior extension of the Xenopus pronephric duct (PD) is complex, consisting of three distinct temporal phases: During the first phase, pronephric and PD tissue segregates from flank mesoderm directly ventral to somites IV-VIII; during the second phase, cells migrate throughout the duct extending it to the axial level of somite XIV; finally, anterior extension of rectal diverticulae (RD) from the cloaca to the posterior tip of the PD is required to complete morphogenesis of a functional conduit for excretory waste. Our studies of axolotl embryos showed that GDNF signaling through the Ret/GFRalpha-1 receptor plays a role in posterior PD extension; we are extending our studies to investigate whether GDNF plays a similar role in Xenopus. Here, we show that Xenopus laevis expresses two GDNF paralogs similar to the long form of mammalian GDNF, and one alternatively-spliced form. We also show that GFRalpha-1 is necessary for the second phase of PD elongation. In addition, the expression patterns of Xenopus gdnf, gfra1 and ret indicate that this signaling system could play a role in both PD and RD morphogenesis. Our strategy for testing whether gdnf is a PD or RD chemoattractant will also be discussed. PSTR

Shannon Melick
Advisor: Dr. Paul Jivoff
Title: Effect of Size on Habitat Preference and Agonistic Behavior in Crayfish
Abstract: Crayfish are freshwater crustaceans that live in streams and lakes. Habitat choice is influenced by many factors for crayfish. Shelters are critical for many species including crayfish so they are a good model for examining the factors influencing shelter use. When there are not enough shelters present for the crayfish, aggressive behaviors between crayfish often occur, to the extent that social dominance hierarchies are created. This study examined the importance of size on habitat preference and on agonistic interactions for shelters. In the lab, three sizes of solitary crayfish were provided three shelter sizes to examine habitat preference. Three different sized class crayfish were used to determine habitat preference for each size and agonistic interactions between crayfish were observed with the presence of one shelter. The results were highly significant. As expected, the smaller size crayfish preferred the smaller shelter, while the larger size preferred the largest shelter. The agonistic interactions lasted longer between the same size class crayfish, while the interactions between a large and small
crayfish were shorter.  PSTR

Zachary Orr
Advisor: Dr. Bruce Burnham
Title: Synthesis of C5 Nucleoside Pyrroles
Abstract: This research focused on a synthesis of a modified nucleoside pyrrole which will mimic IMP and disrupt a cell’s ability to replicate, much like the drug Ribavirin. IMP (inosine monophosphate) is a nucleotide produced by the deamination of adenosine monophosphate (AMP); it is the precursor of AMP and GMP in purine biosynthesis and an intermediate in purine salvage and in purine degradation. This is why a compound which attacks the production of IMP is likely to hinder a cell’s ability to reproduce and live, and can be modified to target cancer or virus cells to treat specific illnesses. In this variation, the nucleotide sugar will be attached to the C5 carbon of the pyrrole. PSTR

Ellyssa Piccinini & Rebecca Hoppe
Advisor: Dr. Cara DiYanni
Title: The relationship between conformity and imitation in Caucasian-American and Asian-American children
Abstract: Previous research recognizes that children focus more on reproducing specific actions than achieving outcomes, and may imitate inefficient and irrelevant actions (Kenward et al., 2011; see also DiYanni & Kelemen, 2008; DiYanni et al., 2011). This phenomenon, known as overimitation, may be a universal trait (Nielsen & Tomaselli, 2010). Additionally, research has shown that children conform to peers who have made erroneous but unanimous judgments before them (Haun & Tomasello, in press). Specifically, Asian American children are more likely to conform than Caucasian Americans (Corriveau & Harris, 2010). Our study looks at whether or not children will imitate an inefficient action performed by three models. Our hypothesis is that three models will increase children’s imitation, and that there will be an even greater increase in conformity among Asian children. Participants were 80 Caucasian and Asian American children ages 3 to 5. Children watched a video with either a single model or three models demonstrating an inefficient action, and it was recorded whether or not they imitated. We also measured their social desirability. Preliminary results suggest no difference in rates of imitation of the single model, but Asian children are somewhat more likely to conform to three models than Caucasian children. PNL

Debra Ratner
Advisor: Dr. Mary Poteau-Tralie
Title: Poetry en Francais
Abstract: The poetry I will present was, in large part inspired by my class in the French section of the Department of Foreign Languages and Literatures called The Self in Prose and Poetry taught by Dr. Mary Poteau-Tralie. We examined the theme of the Self or “Le moi” through readings of French poems and short stories. I enjoyed all of the texts we studied, but the poetry of the Symbolist movement during the late 19th century, really captured my heart. This poetry shows the resurgence of a romantic thread in literature and the arts that had been latent
during the Industrial Revolution. It marks the beginning of a series of Avant-Garde movements in western literature, including Symbolism, Dada/Surrealism, and is also found in 20th century poetry in the francophone poets of Africa and the Caribbean. Poets such as Baudelaire, Apollinaire, Senghor and Eluard believed that what lays beneath the surface of our consciousness are the most noteworthy to study. The dreamlike imagery and the free association in their poetry appeal to me. PNL

Lauren Runza
Advisor: Dr. Thomas Callahan
Title: The Enemy in the Garden State: Japanese Americans in New Jersey During World War II
Abstract: Japanese Americans have been an oft ignored minority group in American history; most of the attention on them has focused on their fate in being ousted from California following the attack on Pearl Harbor by the forces of Imperial Japan. However, New Jersey has played a disproportionately large role in the history of a number of Japanese Americans, despite their residential populations in the state never reaching even a fragment of the number of those residing on the West Coast. In this paper, I will examine the treatment of Japanese Americans in New Jersey both prior to and during the Second World War, delving into the differences in treatment that they faced across the state at both personal and government levels. PNL

Jessica Scanlon
Advisor: Dr. Pamela Brown
Title: Two Women in Early 20th Century American Public Relations
Abstract: Today women fill the majority of public relations jobs. This trend has been marked since the mid-1980s. Yet, in 1970, 70 percent of public relations practitioners were men. This change is due in part to more women entering the workforce, but also because women were encouraged to enter the field as early as the 1920s by women already in the field. Doris Fleischman, wife and business partner of Edward Bernays, encouraged women to enter public relations from the start of her career. Lorena Hickok, best known for advising Eleanor Roosevelt, encouraged women to enter public relations in magazines articles she wrote as her own public relations career began. Both women were among the earliest female public relations practitioners, breaking barriers during their successful careers. PNL

Nicole Singer
Advisor: Dr. Kathleen Pierce
Title: The Impact of Leadership Training on Pre-service Teachers: a One Year Study of Teacher Leadership
Abstract: The purpose of this study was to examine the perceptions of teacher leadership within the education community, including beginning and experienced teachers as well as school administrators and university teacher educators. Grounded in literature about teaching, leadership, and school culture, the study surveyed local educators about their perceptions of teacher leadership. Responses to open-ended questions were analyzed and discussed in light of actual practice in schools and dominant themes in the data. The most prevalent theme was that leadership is extremely contextual depending on the role of the individual and climate of the school district and field of education. Findings from veteran teachers and school administrators
suggest that “teacher leadership” needs a place to be practiced to be further developed. Beginning teachers report feeling underprepared as leaders entering the field but express interest and desire to learn how to lead. Another significant finding is the variation in opinions about teacher leadership and the feasibility of including teacher leadership in teacher preparation programs among teacher educators. **URSA 2011-2012**

**Christine Sookhdeo**
**Advisor:** Dr. Daniel Druckenbrod
**Title:** Analysis of Properties of Post-Agricultural Soils, Lawrenceville, New Jersey
**Abstract:** The land-use history of a forested area has a significant impact on the biogeochemical cycling of nutrients within the ecosystem. Soil organic matter (SOM) is important when examining the long-term impacts of agricultural practices and is lost when natural vegetation is replaced with cultivated crops. This loss can be reversed when agricultural practices are abandoned and natural vegetation returns. In September 2011, replicate soil samples were obtained from plots within the wooded area on Rider University’s campus. Soils were classified based on past agricultural usage using a 1930s aerial photograph including the following types: cultivated field, pasture, young forest and old forest. The loss on ignition method was used to determine percent organic matter. Soil pH, moisture content, and bulk densities were also determined. Kruskal-Wallis non-parametric ANOVAs were used to analyze soil data. Bulk density of Old Forest and Young Forests are significantly different (P=0.094). Agricultural land had significantly greater pH than Young Forest. Fisher’s exact probability tests were used to analyze the presence and absence of tree species (oaks, maples, tulip poplar, sweet gum, hickories, beech and white ash). Oaks and beech were statistically more frequent in old forests while sweet gum was only present in former agricultural land. **PSTR**

**Jennifer Sorensen**
**Advisor:** Dr. Lucien Frary
**Title:** Past Sufferings, Present Glories: Grassroots Neo-Nazi Extremism in the Russian Federation
**Abstract:** This research project examines the rise of the first wave (1985-1999) of neo-Nazism in Russia. Many people were very surprised by the emergence of a popular neo-Nazi movement in post-Soviet Russia because the Soviet Union defeated Nazi Germany in 1945, yet after the collapse of the Soviet Union in 1991, Russia became the home of almost half of the neo-Nazis in the world. Russia appeared to shift from far-left communism to far-right neo-Nazism almost overnight. However, this project challenges the notion that neo-Nazism in Russia is new and unprecedented. It argues that neo-fascist ideas, such as racial anti-Semitism and defensive ethnic nationalism, were quite popular under (and even before) the Soviet Union. The dissolution of the Soviet Union caused a mood of chaos and political instability which allowed such an extremist movement to proliferate. This project also sheds light on how important it is to understand and investigate neo-Nazi extremism, for it is a serious social force that will not just go away. **URSA 2011-2012**
Matthew Springer & Elizabeth Tkaczynski  
**Advisor:** Dr. Julie Drawbridge  
**Title:** Ambystoma maculatum and Oophila ambystomatis: A Proposed Model System for Investigating Oxygen Sensing during Vertebrate Development  
**Abstract:** The single celled alga, Oophila ambystomatis, lives inside the egg capsule of spotted salamander embryos Ambystoma maculatum. Studies suggest that the relationship between the two organisms is symbiotic; the alga provides developing embryos with oxygen, the embryos may provide a source of nitrogen for the alga. Oophila generate oxygen via photosynthesis, exposing embryos to hyperoxic conditions during the day when photosynthesis is occurring, and hypoxic conditions at night when both embryos and algae are respiring. Hypoxic conditions are known to have generally deleterious effects on vertebrate development, and the molecular pathways by which vertebrate embryos sense oxygen levels and respond to changes in those levels have been described. However, this pathway has only been studied in embryos, which normally experience small changes in oxygen levels during development. Studying the development of Ambystoma maculatum may provide a natural system in which to investigate how normal vertebrate development can occur in an environment of widely fluctuating oxygen concentration. The transcription of HIF-1α and genes involved in embryonic growth are upregulated under hypoxic conditions. Direct target genes of HIF-1α include ERCC-6 and IGFBP-1. Here we present our strategy for investigating oxygen sensing in Ambystoma maculatum through the expression of HIF-1α, ERCC-6, and IGFBP-1.  

Hannah Taylor  
**Advisor:** Dr. Michael Brogan  
**Title:** A Return to Ideology: an analysis of the Tea Party movement and its effects on American political party dynamics  
**Abstract:** There are limited peer-reviewed articles addressing the Tea Party movement, and the existing literature often displays a negative view of the Tea Party, for example, claiming that its emergence is due to racial bias. I argue instead that the Tea Party is a result of Republicans wishing for a return to ideologically-based politics. In my research, I conducted an analysis of the origins of the Tea Party, the motivations of the movement, and the nature of its core ideology. I argue that the Tea Party is the latest iteration of the constant evolution of conservative American political thought, and this phase of the progression contains what I define as the New Conservative Libertarian (NCL) ideology. NCLs favor a small government, believe in a free market, focus on fiscal party, and are Constitutional literalists. I tested this theory by doing a content analysis of the ideological statements of eight Tea Party-affiliated websites. I found significant evidence for the first two ideological points, uncertain evidence for the third, and little evidence for the fourth.  

Tara Taylor  
**Advisor:** Professor Richard Zdan  
**Title:** Charlie Mike: Heroes in the Alley, Veterans and the Organizations that Serve Them  
**Abstract:** This paper analyzes how homeless service-members' embrace of “veteran identities” impacts utilization of temporary or transitional housing programs, and their military benefits. Irrespective of designated “veteran status”, embrace of this label as a defining identity influences perceptions of eligibility, and attitudes of whether benefits are “deserved”. When
attempting to access institutions, homeless service members often find homelessness organizations ill-equipped to accommodate veterans, while veteran service organizations lack comprehensions of homelessness. This disconnect between understanding problems and understanding potential solutions creates an unrealistic requirement; skilled navigation of both types of organizations. As both the number of post-military service-members and their vulnerability to homelessness sharply increase, this paper, using ethnographic analysis, proposes a comprehensive understanding of the distinction between institutional definitions of “veteran status” and its internalization by a service-member, as well as ways to bridge the gap between homeless service-members and the organizations that serve them. PNL

Thomas Vajtay
Advisor: Dr. Todd Weber
Title: “Strain Specific Variation in the Innervation and Integration of the Optic Nerve in the Suprachiasmatic Nuclei of Mice”
Abstract: The suprachiasmatic nuclei (SCN) in mammals acts as a “clock” that organizes physiology and behavior into circadian (i.e. daily) rhythms. The SCN are synchronized to daily light-dark cycles through direct input from the optic nerves, keeping animals active at appropriate times of the day. My project will examine innervation of the SCN in mice that do not show “jetlag” using histochemical techniques as well as examining light-induced gene expression in the SCN in order to better understand how the information from the eyes is integrated in the “clock”. Findings will provide insight into molecular mechanisms underlying jetlag in humans. URSA 2012-2013

Advisor: Dr. Todd Weber
Title: Characterizing Strain Specific Variation in Clock Resetting Behavior
Abstract: All living organisms try to match their internal daily “clock” with the cyclical nature of their environments. In mammals the cyclical exposure to light is of interest, since the there exists neural pathways to use light exposure to reset our biological clock in the brain. Whenever the status quo of the clock in humans is reset to a large degree, we feel the syndrome of jetlag over the multiple days required to resynchronize. Interestingly, there exists a strain of mouse that can compensate for these large resets in the clock. Experiments have shown that the time required to reset the internal clock varies with the duration of light exposure on the day of the clock reset. Moreover, the magnitude of the effect of light varies with the timing of the exposure at particular times of the day. Current experiments are examining the “clock” region of the brain to assess potential molecular/biochemical and anatomical differences between these “fast-shifting” mice and others that behave more similarly to humans. PSTR

Naomi Vernon
Advisor: Dr. Todd Dellinger
Title: "The Frozen Curtain: Expanding Arts Business in the Former Eastern Bloc"
Abstract: The aim of this study is to revive the arts in Eastern Europe. My research is closely related to Professor Todd Dellinger’s current project, “Arts in Transition: The Eastern Bloc.” My research will begin in summer 2012 in Germany, the Czech Republic, and Hungary and will focus on theatre and performing arts institutions. While my research assesses political, social, and economic transitions in the arts, it focuses on providing new roots for expansion of the arts in
post-Cold War era Eastern Europe, and establishes an international connection through adaptation of American practices in arts business. The research is intended to be a foundation for a Fulbright Scholarship application. **URSA 2012-2013**

**Amanda Walker**

**Advisors:** Dr. Kelly Bidle & Dr. James Riggs  
**Title:** The relationship of intestinal microbiota composition to immune function in wild-type and immune molecule knockout mouse strains  
**Abstract:** Within the vertebrate gut lives a multitude of symbiotic bacteria that perform countless functions for their host in exchange for a stable environment to inhabit. Altering the makeup of this gut microbiome has profound effects on a host organism; obesity, parasitic infection, and aberrant immune function are all strongly correlated to an abnormal bacterial composition. Research in Dr. James Riggs’ lab has previously focused on the mechanisms of immune response in both wild-type mice as well as animals missing key immune signaling molecules. Over the last several years, more and more data suggest the gut microbiome plays a key role in immune function. Combining previous research with this new area of interest will serve to broaden our understanding of the relationship between immune function and the vertebrate microbiome as well as the role they both play in maintaining health. This proposal will investigate the characteristics of a normal microbiome as well as the effect of altered immune function on its composition in order to achieve this further insight. **URSA 2011-2012**

**Michelle Wall**

**Advisor:** Dr. Michael Carlin  
**Title:** Nonverbal communication comprehension among individuals with developmental disabilities  
**Abstract:** With constant renovations in current technology, there is a new way to communicate every day. Whether new or old, communication always leaves room for misinterpretation. Receivers in a conversation must read between the lines and inspect nonverbal, facial, and context clues to try and correctly understand the sender’s message. What if an individual lacked the ability to do this? There is a large community with this specific problem. New developmental disorders are being categorized and diagnosed every day. These disorders have a variety of attributes, many of them including the inability to comprehend nonverbal, facial, and context clues. This thesis examines importance of nonverbal communication as a means of understanding the message expressed in face to face communication. It discusses the different disabilities that inhibit people from understanding nonverbal communication. Using observations, surveys, and research, it determines findings on how many interactive cues individuals with developmental deficits are really able to comprehend. It also provides an intervention design for young adults with developmental disabilities. It presents different strategies and suggestions to help them better communicate with fully functioning individuals. The creation of this intervention process would include applying the findings and creating a proposal for better communication based on former studies and personal observations. **PNL**

**Amanda Young**

**Advisor:** Dr. Gabriela Smalley  
**Title:** Sea Urchin Larval Development and Metamorphosis
Abstract: Sea urchins are one of the many marine organisms that reproduce with a predictable annual cycle of gametogenesis and spawning. A species of urchin, *Arbacia punctulata*, reproduces mid-January to April. Once the eggs are fertilized they begin to change into different larval stages. The urchin larvae are planktonic and feed on phytoplankton until they metamorphose. First, the larvae were tested to determine if they respond to light and/or gravitational cues and if the response changes as they age. The larvae were also grown and fed different phytoplankton to determine the effect different species have on their growth and development. Lastly, the larvae were tested to determine if they metamorphose based on cues given off by adults or food. *A. punctulata* larvae did show a vertical preference towards the surface at day 0 when they were small. However, by day 5 they were mainly found towards the bottom, which is likely due to their larger size. It was found that *A. punctulata* grew better when fed *Rhodomonas baltica* than *Isochrysis sp.* and *Karlodinium veneficum*. The larvae also seem to metamorphose when ready, regardless of the cue they receive. PSTR

Lan Zhang
Advisor: Dr. John Adamovics
Title: Optimization of the Synthesis of Leuco Dyes and Development of a Formulation for a Reusable Three-Dimensional Dosimetry
Abstract: The use of 3-dimensional treatment plans such as Intensity-Modulated Radiation Therapy (IMRT) and other complex conformal radiotherapies is expected to increase in the years to come. This type of treatment uses a high dose gradient that has the potential to be toxic to patients due to radiation damage of healthy cells. To minimize this damage, a 3D dosimeter has been developed that better tracks the therapy radiation field to be administered to the cancer patient. An important component of this 3-dimensional dosimeter, which is primarily composed of polyurethane, is a triarylmethane also known as a leuco dye. This leuco dye is initially colorless and turns colored after interaction with radiation. The goal of my project is to synthesize various new leuco dyes and evaluate their chemical properties (solubility, stability, reactivity) including compatibility within the 3-dimensional dosimeter matrix. The leuco dyes were synthesized by the Baeyer condensation, which involves the reaction of benzaldehydes with various phenyl nucleophiles. The newly synthesized leuco dyes were also evaluated at Columbia University Hospital in New York City using typical radiation dose of 5Gy. The results of these will be shown during the conference. PSTR

Michael Zubert
Advisor: Dr. Janet Cape
Title: "Using Digital Audio Workstations to Enhance Learning in High School Music Education Classrooms"
Abstract: The objective of this research is to address the problem of resistance to technology among music educators. The study will focus on the use of GarageBand and Mixcraft software in High School music education classrooms to enhance the way in which music educators convey musical content to their students. I will develop a series of lessons using GarageBand and Mixcraft software to improve curricular content and will pilot the lessons in a six-week after-school program for High School students. Revised lesson plans will be integrated into an online resource for teachers. URSA 2012-2013
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