ISCAP

Independent Scholarship and Creative Activities Presentations

Program
Wednesday, May 4, 2011
May 4, 2011

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,

[Signature]

Mordechai Kozanski
May 4, 2011

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,

Donald A. Steven
Provost and Vice President for Academic Affairs
ISCAP Day
Program At-A-Glance
Wednesday, May 4, 2011
Sweigart Hall
10:00 AM – 4:00 PM

9:30-11:00  Breakfast:  Sweigart Atrium

10:00-10:05  Introduction:  Sweigart Auditorium
Dr. Donald A. Steven

10:05-12:30  URSA Awards Session:  Sweigart Auditorium
Session Chair:  Dr. Danielle Jacobs

12:00-1:00  Dance Showcase (DAN):  Yvonne Theater
Kathryn McCambley “Free at Noon”

12:30-1:45  Poster Session (PSTR) & Lunch:  Sweigart Atrium
Session Chair:  Dr. Shawn Kildea

1:45-2:45  Panel Presentations Session I

2:45-4:00  Light Snack:  Sweigart Atrium

3:00-4:00  Panel Presentations Session II
## URSA Awards Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td><strong>Introduction</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 10:05-10:30 | **Explorations in Ethnomusicology**       | 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  
Di Zhao, Voice Performance (WCA) 2010-2011  
*Allure of the Unattainable: Themes of Lost or Unrequited Love in Early 20th Century German Lieder and Chinese Folk Songs*  
Advisor: Dr. Lindsey Christiansen |
| 10:30-11:00 | **Economic Challenges in the Americas**       | Brian Blanda, Economics (CBA), 2011-2012  
*The Effects of United States Deficit and Debt on the Country’s GDP*  
Advisor: Dr. Kelly Noonan  
Heather Chojnacki, Spanish & Global Multinational Studies (CLAS), 2010-2011  
*Cultural Limits: Challenges to Microfinance in the Southern Cone*  
Advisor: Dr. Hernan Fontanet |
| 11:00-11:30 | **Current Advances in Cancer Research**       | Amanda Walker, Biology (CLAS), 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  
Ashley O’Brien, Biochemistry (CLAS), 2010-2011  
*The Effects of VEGF on Suppression in the Tumor Microenvironment*  
Advisor: Dr. James Riggs |
| 11:30-12:00 | **Class, Culture & Conflict**       | Jennifer Sorensen, History (CLAS), 2011-2012  
*New Currents of Fascism: Neo-Nazism in the Russian Federation*  
Advisor: Dr. Lucien Frary  
Bonnie Cochran-Painter, Liberal Studies (CCS), 2010-2011  
*Is Breastfeeding a Class Issue?*  
Advisor: Dr. Barry Truchil |
| 12:00-12:30 | **Teaching for the 21st Century**       | 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. Carol Brown  
Samantha Bennett & Victoria Capozzalo, Education & Mathematics (CLAES), 2010-2011  
*Effectively Teaching Mathematics in Suburban and Urban School Settings*  
Advisor: Dr. Sylvia Bulgar |
Poster Session
12:30-1:45

1. Samar Alselehdar (Dr. Jonathan Karp): Implications in Neurochemistry of Schizophrenia
2. Caroline Baptist & Christien Laber (Dr. Gabriela Smalley): Influence of Irradiance on Growth, Feeding, and Toxin Production in the Mixotrophic Dinoflagellate Karlodinium veneficum
3. Denise Breen (Dr. Daniel Druckenbrod): Micro Climates & Sustainability of Roofing Materials
5. Janelle De Guzman (Dr. Helen T. Sullivan): Survey of Disaster Mitigation through Use of Alerting Systems
6. Chelsey Del Grosso (Dr. Feng Chen): Studies of Phase Formation of Mn Doped Zinc Titanate Synthesized from Various Wet Chemical Methods
7. Kathleen DiMaiuta (Dr. Laura Hyatt): Anti-Fungal Nature of Brassicaceae Secondary Metabolites
8. Claudia Ely (Dr. Feng Chen): Synthesis and Characterization of Zinc Titanates Doped with MgTiO₃
9. Greg Ferrara (Dr. Lucien Frary): What Lay Ahead: American Propaganda During the Grimmest Moments of World War II
11. Paul Ghattas (Dr. Danielle Jacobs): Catalytic, Solvent-Free Preparation of N-(2-(Pyridin-2-yl)-ethyl)sulfonamides
12. Sarah Homan (Dr. James Riggs): Monitoring Expression of the Erythropoietin Receptor in a Model of the Tumor Microenvironment
13. Sylvia Hyra (Dr. Bruce Burnham): Synthesis of Pyrrole Nucleoside Derivatives
15. Yuliya Labko (Dr. Laura Hyatt): Effect of A. petiolata’s Demographic Status on Myrosinase and Sinigrin Concentration in Field Soil
16. Thaiphi Luu & Erin McCafferty (Dr. Julie Drawbridge): A Role for GDNF in Pronephric Duct Cell Migration in Xenopus laevis
17. Michael McCormack (Dr. Daniel Druckenbrod): Forest Cover and Topography through Time at Mount Vernon
18. Kyle Munley (Dr. Gabriela Smalley): An Examination of Nutrient Concentrations and Chlorophyll and Bacterial Abundance in Centennial Lake
19. Lauren Musumeci (Dr. Danielle Jacobs): Glycolate Alkylations with 2-(Methylido)acrylates Toward the Synthesis of Majorynolide & Majorenolide
20. Obiaku Ohiaeri (Dr. Bruce Burnham): Synthesis of 2,3,4-Trisubstituted Pyrrole Nucleosides Derived from Butyrophenone
21. Victoria Resnick (Dr. Nadia Ansary): Perceived Discrimination and the Prevalence of Depression and Anxiety: A Study of Muslim Youth
22. Diana Rojas (Dr. Jonathan Karp): Handling and Restraint Effects on Skin Inflammatory and Antibody Responses in Male C57BL/6 Mice
23. Christine Sookhdeo (Dr. Daniel Druckenbrod): Effect of Forest Age and Past Land Use on Organic Carbon Content of Mount Vernon, VA Soils
24. Dawn Whetstone (Dr. Stephanie Golski): Do Traumatic Content and Trait Anxiety Influence Recall of Situations?
# Panel Presentations
## Session I
1:45-2:45

### Panel A: Life Science (SCI)
**Location:** Sweigart 117  
**Session Chair:** Dr. Phillip Lowrey (URSA Committee, Department of Biology)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:45</td>
<td>Joseph Park</td>
<td>PCR-Based Random Mutagenesis of Mammalian CKIε</td>
</tr>
<tr>
<td>2:00</td>
<td>Amy Werda</td>
<td>Characterization of Peritoneal T Cell Biology in Programmed Death Ligand-1 (PD-L1) Knockout Mice</td>
</tr>
<tr>
<td>2:15</td>
<td>Natalie Baggett</td>
<td>Response Of The Haloarchaeon, <em>Haloferax volcanii</em>, To High Temperature Stress, As Evidenced By Elevated Caspase-like Activity And Protein Expression</td>
</tr>
<tr>
<td>2:30</td>
<td>Robert Weber</td>
<td>The Effect of Nutrient Pulses on the Growth of the Common Reed, <em>Phragmites australis</em></td>
</tr>
</tbody>
</table>

### Panel B: China Spotlight (CHN)
**Location:** Sweigart 118  
**Session Chair:** Dr. Dianne Garyantes (Department of Communication & Journalism)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:45</td>
<td>Matthew Brook</td>
<td>Political Reform in Contemporary China</td>
</tr>
<tr>
<td>2:00</td>
<td>Tao Li &amp; Jingrong Xie</td>
<td>Teaching Computer-Assisted Reporting in China</td>
</tr>
<tr>
<td>2:15</td>
<td>Xing Chen, Samantha Corral &amp; Siting Fan</td>
<td>Intercultural Conversation: Bridging the Gaps of American and Chinese Cultures</td>
</tr>
</tbody>
</table>

### Panel C: Feast or Famine (FST)
**Location:** Sweigart 110  
**Session Chair:** Dr. Heather Casey (URSA Committee, Department of Teacher Education)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:45</td>
<td>Noah Breen, Giles Nowlan, &amp; Tara Sochalski</td>
<td>Obesity and Stakeholder Pressure</td>
</tr>
<tr>
<td>2:15</td>
<td>Brittany Bickerton</td>
<td>A Life Long Struggle</td>
</tr>
</tbody>
</table>

### Panel D: Studio Showcase (SHW)
**Location:** Sweigart Auditorium  
**Session Chair:** Dr. Jerry Rife (URSA Committee, Department of Fine Arts)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:45</td>
<td>Timothy Joya</td>
<td>Homemade Fusion - A Contemporary Song Cycle</td>
</tr>
<tr>
<td>2:15</td>
<td>Julie Morcate</td>
<td>On My Zephyr: A Student's Odyssey</td>
</tr>
</tbody>
</table>
### Panel Presentations

**Session II**

3:00-4:00

#### Panel E: Cultural Studies (CUL)

**Location:** Sweigart 118  
**Session Chair:** Dr. Brooke Hunter (URSA Committee, Department of History)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00</td>
<td>Kerry Richman</td>
<td>Federico García Lorca - A Painter With Words: Images of Nature and Color in Poetry and Theater</td>
</tr>
<tr>
<td>3:15</td>
<td>John Gratton</td>
<td>Changing the Beat: New Methods for the Analysis of Hip-hop</td>
</tr>
<tr>
<td>3:30</td>
<td>Nicole Van de Vaarst</td>
<td>Ketchup in American Culture</td>
</tr>
</tbody>
</table>

#### Panel F: Environmental Issues (ENV)

**Location:** Sweigart 117  
**Session Chair:** Dr. Laura Hyatt (Department of Biology)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00</td>
<td>Brenna Simonson</td>
<td>Lessons from Montreal, Kyoto, and Copenhagen: The Viability of Future Environmental Policies</td>
</tr>
<tr>
<td>3:30</td>
<td>Jennifer Whiting</td>
<td>Corporate and Social Elements of Photography in the Gas Drilling Industry</td>
</tr>
<tr>
<td>3:45</td>
<td>Elizabeth Evans</td>
<td>Assessment of Three Artisanal Fisheries in Northern Honduras: Río Esteban, Chachahuate Cay, Cayo Mejor/East End</td>
</tr>
</tbody>
</table>

#### Panel G: Mind, Body & Soul (MND)

**Location:** Sweigart 110  
**Session Chair:** Dr. Roberta Fiske-Rusciano (URSA Committee, Department of Global Studies)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00</td>
<td>Tom Mellaci</td>
<td>Head Games</td>
</tr>
<tr>
<td>3:15</td>
<td>Rebecca Davison</td>
<td>Verbal and Spatial Task Performance in Women as a Function of Menstrual Phase</td>
</tr>
<tr>
<td>3:30</td>
<td>Dan Petrino</td>
<td>A Gift of Life</td>
</tr>
</tbody>
</table>
Samar Alselehdar

**Advisor:** Dr. Jonathan Karp  
**Title:** Ketamine on Brain and Behavior: Implications in Neurochemistry of Schizophrenia  
**Abstract:** Ketamine, a NMDA receptor antagonist, induces both positive and negative symptoms of schizophrenia in humans and other mammals and exacerbate psychotic symptoms in schizophrenic patients. Early studies explained these effects of ketamine using the dopamine-glutamate theory of schizophrenia. Current research suggests that schizophrenia is not caused primarily by changes in dopamine and glutamate neurotransmission, but rather might be better explained as a culmination of numerous neurotransmitter interactions in which dopamine and glutamate are merely notable players. This study examines a potential mechanism by which some neurotransmitters function to induce schizophrenic-like symptoms in C57BL/6 mice. Ketamine (25 mg/kg) and picrotoxin (1 mg/kg; GABA receptor antagonist) were treated alone and in combination and changes in dopamine chemistry in the striatum, prefrontal cortex, and behavior were recorded. HPLC analysis with electrochemical detection revealed that ketamine increases dopamine and picrotoxin prevents ketamine-induced dopamine increase in the striatum. Open field analysis revealed ketamine initially increases locomotion (positive symptoms) and over time decreased locomotion. Negative symptoms may not be induced by dopamine activity alone but by other neurotransmitters known to play a role in schizophrenia. PSTR

Natalie Baggett

**Advisor:** Dr. Kelly Bidle  
**Title:** Response Of The Haloarchaeon, *Haloferax volcanii*, To High Temperature Stress, As Evidenced By Elevated Caspase-like Activity And Protein Expression  
**Abstract:** One of the more enigmatic features of prokaryote and unicellular eukaryote evolution is the emergence of programmed cell death (PCD) pathways, a genetically controlled form of cell suicide initiated by a variety of environmental stimuli. In multicellular eukaryotes, PCD is initiated and executed by a distinct class of cysteine aspartate-specific proteases, known as caspases, that trigger an irreversible, orderly biochemical cascade of cellular disassembly and death. Until recently, PCD was thought to be the proprietary function of higher eukaryotes, since it is essential for the survival, development, and differentiation of metazoans. However, the discovery of PCD-markers, caspase activity and orthologues in morphologically diverse organisms such as plants, fungi, and unicellular protozoa, suggests they are a fundamental feature of unicellular life that led to the emergence of the cell death machinery. Until recently, Archaea have been notably absent from the PCD inheritance discussion, likely due to a lack of recognizable genetic homologues to key PCD genes. However, given the deep archaeal roots of eukaryotes, it is of considerable interest to investigate whether caspase-like activity can be found in Archaea. We recently demonstrated extremely high caspase activity and expression in the haloarchaeon, *Haloferax volcanii*, with an ostensible role in adaptation to salt stress. Here, we discuss our data examining the response of *H. volcanii* to high temperature stress, as demonstrated by caspase activity assays and protein expression. Our results indicate
that short-term heat shock leads to a decrease in caspase-like activity, with full recovery seen within one hour. Prolonged exposure to elevated temperature appears to modestly increase caspase activity over that seen in optimal growth conditions. Ongoing efforts are attempting to ascertain the identity of the protein(s) responsible for caspase-like activity and expression in H. volcanii. Our accumulated data suggest that the enzyme(s) responsible for caspase-like activity in H. volcanii represents a unique, evolutionarily distinct subset of proteins from those of higher eukaryotes. SCI

Caroline Baptist & Christien Laber

Advisor: Dr. Gabriela Smalley
Title: Influence of Irradiance on Growth, Feeding, and Toxin Production in the Mixotrophic Dinoflagellate Karlodinium veneficum
Abstract: The mixotrophic dinoflagellate Karlodinium veneficum produces karlotoxins (KmTx) that have been associated with fish kills. We investigated the influence of irradiance on KmTx levels in two strains of K. veneficum, PD-6 and CCMP-1974. K. veneficum was grown autotrophically at six different irradiances (dark to 190 μmol photons m-2 s-1). Growth was monitored and toxin levels were measured during exponential and stationary growth phases. Cell size was also monitored. Separately, feeding on cryptophyte prey was determined at each light level. PD-6 growth saturated above 30 μmol photons m-2 s-1 around 0.4 divisions day-1 and was negative at or below irradiance levels of 12 μmol photons m-2 s-1. PD-6 cellular KmTx quota was positively correlated with irradiance and did not plateau over the range of irradiances utilized here. PD-6 feeding rates increased with light intensity, saturating above 30 μmol photons m-2 s-1 at 0.2 food vacuoles h-1. CCMP 1974 did not produce karlotoxin. CCMP 1974 feeding rates were also negligible. Toxicity in PD-6 was clearly influenced by irradiance. This may help explain some of the natural variability in cellular KmTx quota observed in the field. Further, KmTx production appears to be essential in the feeding process of K. veneficum. PSTR

Samantha Bennett & Victoria Capozzalo

Advisor: Dr. Sylvia Bulgar
Title: Effectively Teaching Mathematics in Suburban & Urban High School Settings
Abstract: Our project aims to explore the teaching strategies utilized in fourth and fifth grade classrooms in both urban and suburban schools. Our research will involve two major questions. The first question concerns discovering which method of teaching is most effective for upper elementary students in urban and suburban schools. Separately, we will have our own conclusions from our independent research. After we have completed our individual study, we will then collaborate to answer our second question. We would like to find out if there is a clear difference between how students in grades four and five in urban and suburban schools effectively learn mathematics. We will each gather data, one focusing on the suburban school setting and the other the urban setting. Each of us will be observing at least one fourth and fifth grade classroom that follows the traditional method of teaching mathematics, which is drill and practice. A second set of classrooms (4-5) will focus on
learning mathematics through inquiry-based strategies and discovery learning.  
URSA Recipients 2010-2011

Brittany Bickerton

Advisor: Dr. Shawn Kildea  
Title: A Life Long Struggle  
Abstract: This a film that utilizes interviews to document the experiences of three people who suffer from eating disorders. It explores the causes and disturbing effects of these disorders. The subjects describe their own struggles and the impact their illnesses have had on their families and friends. The viewer gets a first-hand account of what it is like for an anorexic to submit to rehabilitation and then to go through with it. Ultimately viewers get a sense of the never-ending struggle that people who suffer from eating disorders must endure day to day. FST

Brian Blanda

Advisor: Dr. Kelly Noonan  
Title: The Effects of United States Deficit & Debt on the Country’s GDP  
Abstract: 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 in relation to GDP as well as a detailed economic overview of the effects of past policies. Current fiscal and monetary policies in response to the United States’ most recent recession will be examined and analyzed to understand their impact on the budget versus their impact on GDP output. Suggested policies will be presented using empirical data. 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 Recipient 2011-2012

Corrine Bostic

Advisor: Dr. Alison Thomas-Cottingham  
Title: The Effectiveness of Cognitive-Behavioral HIV Interventions on Condom Use Among African-American Women: A Meta Analysis  
Abstract: African-American women are negatively impacted by HIV and resources for prevention are limited. Cognitive-behavioral interventions abound in the area of HIV prevention. One approach to evaluate these efforts is meta analysis which allows for the quantitative synthesis of results from empirical studies. A literature search yielded eight studies which met inclusion criteria. Although no differences were found in knowledge as a function of treatment condition, suggestions were made for future research.  
PSTR

Denise Breen

Advisor: Dr. Daniel Druckenbrod  
Title: Micro Climates & Sustainability of Roofing Materials  
Abstract: Recent global increases in Earth’s temperature have led engineers and researchers to work hand-in-hand to develop the most effective tools to lower
emissions and global temperature, while increasing awareness and overall acceptance of these tools. As roofs are the most exposed surface of any building to solar radiation, it is essential to pick the most efficient material. The reflection of incoming solar radiation can reduce heating and cooling costs throughout the life-time of the building, but on a larger scale, can also decrease surrounding atmospheric temperatures in the environment. This research experiment examines the albedo and surface temperatures of various common roofing materials found in New Jersey. White roof covering, grey shingles, stone pebbles, black shingles have been be tested and analyzed in order to see which sample has the highest albedo, lowest temperature, and is most efficient. Using repeated measures of ANOVA data analysis, this study shows that there is a significant difference between the temperatures of all the roofing materials tested at 10am and at 2pm, supporting a difference in long-term efforts to minimize roofing temperatures.

**Noah Breen, Giles Nowlan, & Tara Sochalski**

**Advisor:** Dr. Ilene V. Goldberg  
**Title:** Obesity and Stakeholder Pressure  
**Abstract:** This presentation reviews the issue of how stakeholders are pressuring the restaurant, snack food, and processed food industry to tackle the nationwide epidemic of obesity in America. The role of government as a stakeholder is discussed in detail as well. A few specific topics touched upon in relation to government and obesity are statutes, ordinances, lawsuits, taxes, funding, and education. Also, the food industry response to such pressures is briefly highlighted. The presentation is colorful, engaging, and informative. **FST**

**Matthew Brook**

**Advisor:** Dr. Diqing Lou  
**Title:** Political Reform in Contemporary China  
**Abstract:** This project will discuss China's political reform since the 1970's. In this project I will discuss the effects of political reform on the Chinese economy, government, and society. Since the founding of the People's Republic of China in 1949, the Chinese government has gone through tremendous change throughout the decades. Although the Chinese Communist Party is still in power, it has gone through shifts in ideology and methods of policy implementation. In this presentation, I will discuss the different methods that Chinese leaders have introduced to modernize and industrialize China. Each leader has a unique way of governing the country and the Chinese Communist Party. The changes within the Chinese Communist Party have also changed along with the change in the economy and society which are all related. The Party has become less of a party of peasants and workers and more of a national technocratic party. This is an important factor that I will discuss and why this topic relates to China's modernization. I will also discuss how free-market attitudes in the political system have affected China's economy and society. This project will be done with an oral presentation and power point. **CHN**
Independent Scholarship & Creative Activities Presentations (ISCAP 2011)

Xing Chen, Samantha Corral and Siting Fan

**Advisor:** Dr. Minmin Wang  
**Title:** Intercultural Conversation: Bridging the Gaps of American and Chinese Cultures  
**Abstract:** The purpose of this presentation is to highlight the cultural differences and similarities between American and Chinese college students, focusing on cultural shocks experienced by both Rider and Sanda students in face-to-face communication. The presentation will also analyze misunderstandings and misconceptions occurred in Rider-Sanda students conversations, using Hofstede's cultural dimension of individualism and collectivism, and Hall’s high-context and low-context communication. The presentation will conclude with a set of suggestions we would like to offer for how to promote and improve communication between American and international students. CHN

---

Bonnie Cochran-Painter

**Advisor:** Dr. Barry Truchil  
**Title:** Is Breastfeeding a Class Issue?  
**Abstract:** This proposed research will examine the extent to which the decision to either breastfeed or use infant formula is influenced by the social class of the mother. The consequences of this decision for the health of babies will also be addressed. Affluent mothers, who were influenced by information from infant formula companies and government agencies, were the only ones to use infant formula. New mothers from these socioeconomic backgrounds have since switched to breastfeeding because of newer information on the many benefits to the mother and infant. Ironically, poor and working class women, who used to rely on inexpensive breastfeeding, have increasingly turned to infant formula to feed their babies. Such a decision has both financial consequences for the family, as well as health consequences for the babies. This research will examine patterns of breastfeeding and infant formula by social class. The role of the infant formula industry, public health organizations and the federal government will also be analyzed in order to determine their impact on the decisions of mothers in different social classes. Research will be performed by examining government data, reading secondary literature and interviewing key individuals in government, infant formula companies and public health organizations.  
**URSA Recipient 2010-2011**

---

Heather Chojnacki

**Advisor:** Hernan Fontanet  
**Title:** Cultural Limits: Challenges to Microfinance in the Southern Cone  
**Abstract:** This research paper focuses on the challenges facing the microfinance industry in South America’s Southern Cone with a particular emphasis on urban areas in Argentina. It summarizes the current status of the microfinance industry and goes on to describe the challenges to it. It focuses on cultural challenges such as stereotypes and gender hierarchy rather than financial or political challenges. It discusses the role that culture plays in discouraging clients from borrowing and in preventing microfinance institutions from investing in that particular geographical region.  
**URSA Recipient 2010-2011**
Rebecca Davison

Advisor: Dr. Stephanie Golski
Title: Verbal and Spatial Task Performance in Women as a Function of Menstrual Phase
Abstract: At different times throughout a women’s menstrual cycle the amount of the hormone estrogen fluctuates. Research has shown that when there is a higher level of estrogen women tend to perform better on verbal tasks and poorer on spatial tasks. The aim of this study was to examine a woman’s ability to perform spatial and verbal tasks at varying times of her menstrual cycle. We hypothesized that women would display a better performance on verbal tasks during the midluteal phase of the menstrual cycle opposed to a poorer performance on verbal tasks during menstruation. We also hypothesized that women would display a better performance on spatial tasks during menses opposed to a poorer performance on spatial tasks during the midluteal phase of the menstrual cycle. Data collection is ongoing, preliminary results will be discussed. MND

Janelle De Guzman

Advisor: Dr. Helen T. Sullivan
Title: Survey of Disaster Mitigation through Use of Alerting Systems
Abstract: The purpose of the Survey of Disaster Mitigation through Use of Alerting Systems was to better understand how people may use and benefit from safety alerts delivered on cell phones and to examine various aspects of signals or cueing as well as to determine the understanding of abstract signage. The survey was composed and carried out on a computer using a variety of questions related to cell phone usage in general and specifically questions dealing with Emergency Notification. Over 100 undergraduate students were surveyed during the experiment. Statistical analysis of the results were collected and analyzed by Janelle De Guzman and Dr. Helen T. Sullivan. PSTR

Chelsey Del Grosso

Advisor: Dr. Feng Chen
Title: Studies of Phase Formation of Mn Doped Zinc Titanate Synthesized from Various Wet Chemical Methods
Abstract: The hexagonal Ilmenite structure of ZnTiO$_3$ possesses attractive dielectric properties that allow this material to be used in microwave applications such as mobile telephones, satellite communication systems and satellite television receivers. However, ZnTiO$_3$ has a narrow temperature stability range, which makes this compound particularly difficult to synthesize, therefore we used several synthetic methods to prepare the material and to study their phase stability under various experimental conditions. Zn$_{1-x}$Mn$_x$TiO$_3$, 0≤x≤1, was synthesized through various wet chemical methods, which include Sol-Gel, Sonochemical and a solution chemical method with a cationic surfactant. All samples were analyzed using a Rigaku Powder X-Ray Diffractometer. A nearly pure Ilmenite structure of Zn$_{1-x}$Mn$_x$TiO$_3$, where 0.30≤x≤0.50, was synthesized from the solution chemistry method while a nearly pure structure of Zn$_{1-x}$Mn$_x$TiO$_3$ where x = 0 was obtained through the Sol-Gel chemistry route. A Sonochemical synthetic method was also explored in this study where Zn$_{0.5}$Mn$_{0.5}$TiO$_3$ was synthesized and a phase formation study was performed. It was found that the Ilmenite structure of ZnTiO$_3$, if doped with Mn, can be stabilized at higher temperatures above 900°C. Further
efforts will be made to synthesize this phase in pure form at lower temperatures, thus making this phase more stable at a wider temperature range. 

Kathleen DiMaiuta

Advisor: Dr. Laura Hyatt
Title: Anti-Fungal Nature of Brassicaceae Secondary Metabolites
Abstract: Brassicaceae is a family of plants that contains many successful invasive species, including *Brassica rapa* and *Alliaria petiolata*. This family is unique in that it does not form relationships with fungi that can help the plants obtain nitrogen and other resources in return of providing fungi with food and shelter. Plants in the Brassicaceae family also produce glucosinolates, a secondary metabolite, which may contribute to their success as an invasive species. These metabolites will be analyzed to exam whether they have anti-fungal properties which may make it more difficult for indigenous species to survive, leading to Brassicaceae invasion.

Claudia Ely

Advisor: Dr. Feng Chen
Title: Synthesis and Characterization of Zinc Titanates Doped with MgTiO₃
Abstract: ZnTiO₃, with ilmenite crystal structure, has good microwave dielectric properties that meet requirements for use in microwave applications. However, ZnTiO₃ is not stable at low temperatures and it will also decompose around 950°C. Therefore the goal for this research was to synthesize and modify the ZnTiO₃ compound to make it thermally stable. Mg was doped into the (Zn₁₋ₓMgₓ)TiO₃ framework via sol-gel and sonochemical methods. The products obtained from both methods were then subjected to heat treatments ranging from 600°C to 950°C and a Rigaku powder X-Ray Diffractometer was used for phase analysis. For the sol-gel method, the (Zn₁₋ₓMgₓ)TiO₃ with ilmenite crystal structure, a nearly pure phase with x = 0.2 was synthesized at 800°C with trace impurities. The low temperature phase of ZnTiO₃, with cubic crystal structure, was observed at 600°C. The (Zn₀.₈Mg₀.₂)TiO₃ framework has a negative temperature coefficient of resonant frequency while the CaTiO₃ has a very positive temperature coefficient of resonant frequency. With a small amount of CaTiO₃ doped into the material, the product may then have a stable temperature coefficient of resonant frequency of zero. This was also successfully doped into the (Zn₀.₈Mg₀.₂)TiO₃ framework. For the sonochemical method, nearly pure ZnTiO₃ has been synthesized at 800°C over 3 days.

Elizabeth Evans

Advisor: Dr. Gabriela Smalley
Title: Assessment of Three Artisanal Fisheries in Northern Honduras: Río Esteban, Chachahuate Cay, Cayo Mejor/East End
Abstract: To provide a baseline for future management, artisanal fisheries off northern Honduras were assessed between June and August 2010. Catch effort, fishing area, target species, daily catch rates, fishing seasons, and current regulations were determined by interviewing local fishermen in each community, and taking landings data on a daily basis. A large percentage of the lobsters being landed are much smaller than the required 5.5 inches, suggesting that a significant number of
juvenile lobsters are being removed from the population. Due to the briefness of the study, it is hard to determine whether any of the fisheries are being overfished. However, local fishermen observed that fish and lobster stocks have decreased drastically, and most fishermen no longer earn the necessary incomes to continue fishing. The only fishermen showing any significant profits are the owners of the lobster fishing boats. The results from this study suggest that the fishing practices being used in Honduras are not as efficient or environmentally friendly as those of similar fisheries in other areas of the Caribbean. The lobster fishery is clearly the most attractive option to fishers however should be a concern due to dangerous fishing practices and harmful catch yields.

ENV.

Greg Ferrara

Advisor: Dr. Lucien Frary
Title: What Lay Ahead: American Propaganda During the Grimmiest Moments of World War II
Abstract: Anti-Japanese poster art is a distinct part of American World War II historiography, but it is an inaccurate depiction of overall American opinion for the time period. Racial depictions of the Japanese do not fully express the wartime spirit present at all levels of American society. These graphic posters, typically calling attention to exaggerated features unique to Japanese racial stereotypes, were in reality ineffective by propaganda standards and had a limited market audience. Their messages were not always straightforward or related to the war effort, but rather sought to separate the Japanese from American society as a distinguishable “Other” category. Race was certainly an integrated aspect of American involvement in the war, but a more unifying concept existed in the minds of all Americans: an end to the war. This presentation will analyze propaganda poster art and consult primary and secondary sources to determine realistic popular opinion concerning the Pacific War in the U.S. federal government, on the home front, and in the Pacific Theater. Armed with this knowledge, the current observer must not mistake anti-Japanese poster art as a general representation of American thoughts and opinions during World War II.

PSTR

Daniel Gartenberg

Advisor: Dr. John Adamovics
Title: Optimization of the Synthesis of Leuco Malachite Green and Development of a Formulation for a Reusable Three-Dimensional Dosimetry
Abstract: More than 700,000 patients annually in the United States are therapeutically treated with radiation. The use of 3-dimensional treatment plans such as Intensity-modulated radiation therapy (IMRT) and other complex conformal radiotherapies is steadily increasing. This trend is expected to grow to where 40% of all radiation treatments will be performed with these complex radiotherapies. IMRT employs the use of high dose gradients. Therefore it is possible to deliver high doses to target volumes while maintaining low doses to nearby critical normal structures to a much greater extent than is the case with conventional radiation therapy. To improve the ability of medical physicists to provide greater assurance of patient safety, a volumetric dosimeter (a device used to measure radiation) is desirable. This study is concerned with the creation of radiation
dosimeters in order to measure radiation exposure. This is done by using various basic and acidic compounds in order to figure out the effects on the desired product. PSTR

Paul Ghattas

Advisor: Dr. Danielle Jacobs
Title: Catalytic, Solvent-Free Preparation of N-(2-(Pyridin-2-yl)-ethyl)sulfonamides
Abstract: Over 90% of current drug candidates, agrochemicals, and other synthetic materials possess nitrogen-containing rings such as pyridine. Similarly, many known drugs contain sulfonamides, which are renowned for their great capability as antibiotic agents. Although nitrogen-containing heterocycles and sulfonamides both play a crucial role in the chemical and pharmaceutical industries, very little research has investigated methodology which joins the two functional groups to form the N-(2-(pyridin-2-yl)ethyl)sulfonamide backbone. Our laboratory has discovered an efficient method to unite vinyl pyridines and sulfonamides via an aza-1,4-conjugate addition towards this goal. While the poor electrophilic and nucleophilic properties of the reagents pose limitations for unifying the two functional groups, the use of an inorganic base and ionic solvent facilitates this synthetic methodology. TBAI catalysis is proposed to be two-fold: (1) solvation of the reagents, and (2) SN2’ activation of the vinyl pyridine with iodide. Kinetic studies in the laboratory are ongoing to understand the role and effect of each reagent on the reaction, as well as to discover an environmentally responsible and cost efficient method to isolate the product free of undesired bis-alkylated or hydrolyzed byproducts. PSTR

John Gratton

Advisor: Dr. Mickey Hess
Title: Changing the Beat: New Methods for the Analysis of Hip-hop
Abstract: Hip-hop music has achieved wide acclaim in popular culture. Academia however, has yet to recognize that hip-hop stems from a tremendously different musical background than other Western music. As a result of this, scholars who write about hip-hop force it to fit into a pre-established mold without considering the techniques or purpose of this music. This project will examine the ways in which hip-hop is created, and seek to form a new analytical method that considers hip-hop on its own terms. Hip-hop’s new compositional techniques force composers to challenge many basic ideas of Western musical structure and form. In addition to this, the way hip-hop connects with the lineage of African-American music will be discussed, as well as, the ways in which artists have pushed the boundaries within the forms established by the earliest DJ's and MC's. With new methods of analysis, the artistry of hip-hop could be fully recognized. CUL

Sarah Homan

Advisor: Dr. James Riggs
Title: Monitoring Expression of the Erythropoietin Receptor in a Model of the Tumor Microenvironment
Abstract: Erythropoietin (EPO), a hormone that increases red blood cell production in the bone marrow, is a commonly used treatment to combat anemia in cancer patients who have undergone intense chemo- and radio- therapies. However, it has been found that when EPO is given to cancer patients for extended periods of
time there is a higher risk of relapse and an increase in tumor growth. In a culture system that reproduces key features of the tumor microenvironment, we have found that macrophages suppress T cells, the very cells needed to combat the tumor cells. In our research, we found that EPO increases T cell suppression in this system. We are conducting studies to examine which cells express the EPO receptor (EPOR) and how EPO affects other cells of the immune system, such as B cells. PSTR

Sylvia Hyra

Advisor: Dr. Bruce Burnham
Title: Synthesis of Pyrrole Nucleoside Derivatives
Abstract: The objective is to develop methods to synthesize pyrrole nucleosides with various functional groups based on natural marine products. The key is to produce a 2-phenyl-acetophenone first to produce the pyrrole ring. These are produced by using a Friedel-Crafts acylation, an electrophilic substitution, or a Grignard reaction followed by oxidation of the alcohol. These pyrroles could then possibly be used as anti-viral or anti-cancer drugs that show inosine monophosphate dehydrogenase (IMDH) inhibition, which is similar to the drug ribavirin, a drug used to treat hepatitis C. PSTR

Nina Joffe & Matthew Springer

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. This symbiosis has interesting implications for embryogenesis. Since Oophila generate oxygen via photosynthesis, the embryos are exposed to hyperoxic conditions during the day when photosynthesis is occurring, and hypoxic to anoxic 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 very small changes in oxygen levels during development. Therefore, studying the development of Ambystoma maculatum may provide us with a natural system in which to investigate how normal vertebrate development can occur in an environment of widely fluctuating oxygen concentration. Here, we present our preliminary findings on the algal and microbial community isolated from embryonic capsules, as well as our strategy for investigating the oxygen sensing system in Ambystoma maculatum embryos. PSTR

Timothy Joya

Advisor: Dr. Mariann Cook
Title: Homemade Fusion - A Contemporary Song Cycle
Abstract: As a Rider Musical Theatre Major who has been a part of a rapidly developing
program ever since the major’s first year on the Lawrenceville campus, I have seen many peers go through their training with few on-campus performances under their belt. I desired to create another performance opportunity to help abate this scarcity of stage-time. I proposed the contemporary song cycle Homemade Fusion to my faculty advisor and with her approval, contacted the composer/lyricist, purchased the rights, and formed my cast. By choosing to put on a show by the end of this semester, I created a set of challenges that I had not anticipated and have been exploring my ability to take any action necessary to make sure the show happens successfully. I took on the roles of producer, director, intermediary, stage manager, and actor and learned by doing. I now have a better sense of how each role functions and how to perceive a theatrical production from each role’s perspective. The anticipated result is an entertaining well-acted and well-sung musical theatre show. I hope that this show sets a strong precedent for independent on-campus student productions for I plan to bring more new theatre works to Rider. SHW

Yuliya Labko

Advisor: Dr. Laura Hyatt
Title: Effect of A. petiolata’s Demographic Status on Myrosinase and Sinigrin Concentration in Field Soil
Abstract: Alliaria petiolata is a biennial plant in the Brassicaceae family. It is an exotic, invasive that has been invading Northeastern U.S. forest understories since the early 20th century. Recent research has suggested that chemical exudates from A. petiolata in the soil suppress native species. Some of these exudates include sinigrin, a glucosinolate that is degraded by myrosinase, an enzyme that is common in the soil and also present in A. petiolata. The product of this degradation, isothiocyanate, negatively impacts the growth and survival of neighboring, indigenous plants and possibly fungi species. Populations of A. petiolata tend to alternate being dominated by juvenile and adult plants. If soil sinigrin concentrations are dependent on population age structure, then A. petiolata’s allelopathic impact is likely to fluctuate over time and space. We modified a method, used in literature, to assay soil sinigrin concentrations, using HPLC analysis of soil extracts. In addition, a recently developed method will be used to measure field soil myrosinase concentrations using size separation columns and spectroscopy. The patterns of enzyme and substrate concentrations in the soil may explain invasiveness and reveal dynamic interactions with native species.

PSTR

Tao Li and Jingrong Xie

Advisor: Dr. Dianne Garyantes
Title: Teaching Computer-Assisted Reporting in China
Abstract: This paper intends to portray the teaching methodology of computer-assisted reporting (CAR) course in China. The author will introduce the basic CAR concepts, spreadsheet programs, basic math, and instill the ways to evaluate the credibility of the information found on the Internet. The emphasis will be on how to guide the students in the research and interpreting information within databases, writing news stories based on the information, and tackling the reporting techniques in ground-breaking news stories. Comparison and contrast concerning CAR news reporting will be made between the U.S. and China. Some of the beats may not be available or
applicable in China, while some prominent features that bear Chinese characteristics are unique and can’t be found in the U.S. Students will encouraged to expand their skills, the depth and breadth of their reporting, and their network of contacts and knowledge. The paper aims to secure democracy in the society of the future.

Thaiphi Luu & Erin McCafferty

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 IVVIII; 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.

Aubrey Maks

Advisor: Dr. Eric Hung
Title: The Significance of Maori Culture in the World of Popular Music
Abstract: For this project I will examine 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 Recipient 2011-2012

Kathryn McCambley

Advisor: Dr. Kimberly Vaccaro
Title: Free at Noon
Abstract: "Free at Noon" explores the intrinsic connection of the mind and body through a series of self-choreographed pieces. Through a broad range of styles including classical ballet, tap, contemporary, modern, jazz, hip hop and acrobatics, the dancers will express the primal human need to communicate our feelings, stories and experiences to others.
Michael McCormack

Advisor: Dr. Daniel Druckenbrod
Title: Forest Cover and Topography through Time at Mount Vernon
Abstract: While basic concepts of forest succession are well understood, their application meets with varied success, depending on the geography and history of the forest in question. This study attempts to discover what factors have driven afforestation in the forests surrounding George Washington’s estate at Mount Vernon, a tract of land along the Potomac River with a primarily agricultural land use history. Using GIS software, historic maps showing forest cover, land use, and boundaries were georeferenced and overlaid on digital orthophotographs to create a measurable, graphic representation of forest cover from the early nineteenth century to present day. Using these historical maps and satellite digital elevation models (DEMs) showing topography, the study examines the relationship between historic and present day forest cover and slope. Using slope values determined from DEMs, the distribution of slopes underneath forested cover are compared with the range of observed slopes across the common extent for the entire 200 year time range. The results support the prediction of an increase in forest cover over time, likely due to abandonment of heavy agricultural production in the mid nineteenth century. A relationship between slope and forest cover through time is also shown, no consistent correlation is evident through time. PSTR

Julie Morcate

Advisor: Dr. Mickey Hess
Title: On My Zephyr: A Student's Odyssey
Abstract: American student Julie Morcate embarks on the journey of her dreams: to see the Old World. Her hunger for people's stories and hyper-acute empathy clash with the rushing mechanical whirl of profit-seeking culture; this odyssey challenges her to remedy the disconnect. Senses honed to pick up movement, she learns how to gallop straddling her dual identity – she fits in anywhere, but home is always elsewhere. Each of the chapters is written in a distinctive form: travelogue, fantasy, playwriting, and experimental prose. Summer closes on her semester in Spain of drinking and dancing, melting into shadows, basking in firelight, and hunting for treasure. She finds gorgeous architecture along with drugs and theft, arduous love in the Republic of Ireland, confusion and aggression in Rome, and a fellowship of Socialists in the city of the Troubles. She climbs castles, gets lost, tears off masks, and hides in mosques. When nobody

Tom Mellaci

Advisor: Dr. Shawn Kildea
Title: Head Games
Abstract: Head trauma in sports is a topic that has received a lot of media attention in recent years. The long-term effects of concussions are becoming more evident as aging ex-professionals are forced to deal with the debilitating consequences. In this film two legendary NFL linebackers discuss the cavalier attitude players had regarding head trauma during their time in the NFL and how attitudes have changed. Also included are interviews with a head trauma specialist and an NFL journalist. All discuss the very difficult decisions that must be made to allow athletes at the professional level to perform while trying to ensure their safety and long-term wellbeing. MND
recognizes her, she learns to rely on her own courage. SHW

Kyle Munley

Advisor: Dr. Gabriela Smalley
Title: An Examination of Nutrient Concentrations and Chlorophyll and Bacterial Abundance in Centennial Lake
Abstract: The purpose of this study was to determine if dissolved nutrient concentration and abundance of chlorophyll and bacteria in a lake are related to inflow. This study was conducted on Centennial Lake at Rider University, in Lawrenceville, NJ. Samples of water were collected from six points around the lake, twice a month, for 3 month period. Each sample was analyzed for three inorganic nutrients; NH4, NO3, and PO4. In addition, a sample from each location was preserved using Glutaraldehyde. Bacteria and planktonic organisms were observed under a fluorescent microscope after being stained with DAPI. An additional sample was placed on filter paper and preserved for spectrographic chlorophyll analysis. This study is currently ongoing, and results will be compared to rainfall records and examined for correlations between chlorophyll, bacterial abundance, nutrient concentrations, and rainfall. Stella modeling software will be used to model inorganic nutrient dynamics in Centennial Lake. PSTR

Lauren Musumeci

Advisor: Dr. Danielle Jacobs
Title: Glycolate Alkylations with 2- (Methyliodo)acrylates Toward the Synthesis of Majorynolide & Majorenolide
Abstract: The natural products majorynolide and majorenolide exhibit cytotoxic activities in human tumor cells. However, a synthetic pathway to construct these molecules has yet to be disclosed. Our laboratory's approach toward these natural products envisions the application of a novel asymmetric glycolate alkylation, using Evans' oxazolidinone as the chiral auxiliary, with 2-methyliodoacrylic esters. Synthesis of the requisite ethyl-, isobutyl-, and t-butyl-2-(methyliodo)acrylates was accomplished applying a known three-step process. Primary results for the alkylation of (S)-p-methoxybenzylglycolyl-i-propyl-2-oxazolidinone demonstrate the viability of employing t-butyl-2-(methyliodo)acrylate as an electrophile, providing products in good yield with >95:5 diastereoselectivity. Alkylation with the ethyl derivative gave various products, most likely resulting from reaction at the alkene terminus as well as the ester carbonyl. Successful alkylations are proposed to occur via an SN2' pathway. This project is currently focused on hydrolysis of the robust ester, and future chiral auxiliary removal with concomitant lactonization, olefin metathesis, and protecting group removal should provide facile access to individual diastereomers of the natural products. PSTR

Ashley O’Brien

Advisor: Dr. James Riggs
Title: The Effects of VEGF on Suppression in the Tumor Microenvironment
Abstract: Patients with cancer often express high levels of vascular endothelial growth factor (VEGF) in their tumors. VEGF is a signaling protein that promotes the growth of new blood vessels. Clusters of cancer cells can only grow to a certain size, because once they are too big, not all cells
have access to the blood supply that they need to survive and continue to grow. Tumor cell production of VEGF triggers the growth of new blood vessels, a process called angiogenesis, which allows the tumor to attain oxygen and nutrients and continue to grow. We have posed the question as to whether VEGF might have additional roles in tumors. Research in Dr. James Riggs’ laboratory has reproduced the immunological parameters found within tumors. High ratios of macrophages relative to T and B lymphocytes promote immune suppression rather than activation. Currently little is known about the effects of VEGF within the tumor microenvironment. Our research has shown that VEGF increases the macrophage-mediated suppression of both T and B lymphocytes. Our research seeks to define the mechanism that allows VEGF to have these effects and intends to provide new avenues for treating cancer.

**URSA Recipient 2010-2011**

**Obiaku Ohiaeri**

**Advisor:** Dr. Bruce Burnham  
**Title:** Synthesis of 2,3,4-Trisubstituted Pyrrole Nucleosides Derived from Butyrophenone  
**Abstract:** The objective of this experiment is to develop efficient methodology to synthesize 2,3,4-trisubstituted pyrrole nucleoside from butyrophenone. The trisubstituted pyrrole nucleoside would be a reasonable compound to be submitted and analyzed for cytotoxic activity, as it is similar to the pyrroles that show cytotoxic activity in vitro and common to the compounds used in the treatment of viruses and as immunosuppressants. First, butyrophenone and DMFA are reacted to form the vinylogous amide. The vinylogous amide is reacted with thionyl chloride to form the beta-chloroenal. Next, the beta-chloroenal is reacted with glycine methyl ester hydrochloride to produce the pyrrole. Finally, the pyrrole is reacted with the ribose to form the pyrrole nucleoside. The results showed a 100% yield of the vinylogous amide when 98% grade DMFA was used, 63% yield for the β-chloroenal, and 14.4% yield for the pyrrole. This experiment showed that 98% grade DMFA worked more efficiently when synthesizing the vinylogous amide than the 94% grade DMFA did.  

**Joseph Park**

**Advisor:** Dr. Phillip Lowrey  
**Title:** PCR-Based Random Mutagenesis of Mammalian CKlε  
**Abstract:** Endogenous 24-hour (circadian) biological clocks are ubiquitous among organisms on Earth and act to entrain the biochemical, physiological, and behavioral rhythms to daily environmental cues. In mammals, casein kinase I epsilon (CKlε) is one of two enzymes identified as core components of the molecular circadian clock. Previously, our laboratory examined the role of CKlε in the mammalian clock through site-specific mutagenesis of specific amino acid residues comprising a phosphate binding pocket. In this study, however, we adopted a new approach in which full-length (1,245 base pair) CKlε cDNA was randomly mutagenized at a frequency of one nucleotide change per cDNA. We accomplished this using a commercially-available, error-prone PCR system. Mutagenized CKlε cDNA was then used to create a library in the E. coli pEXP5-CT expression vector. We determined the location of mutations in individual CKlε clones by aligning their sequences with the wild-type CKlε cDNA sequence. Six random mutants with single amino acid
substitutions at various residues of interest will be selected and functionally screened with a luminometry-based in vitro kinase assay following expression in an *E. coli* cell-free system. Unlike site-specific, the random mutagenesis approach makes no assumptions regarding structure-function relationships of CKIε, and may reveal new regions of CKIε that play an important role in enzyme function. **SCI**

**Dan Petrino**

**Advisor:** Dr. Shawn Kildea  
**Title:** A Gift of Life  
**Abstract:** This film captures the compelling true stories of two men who have become strong advocates of organ donation after tragedy struck their families. There are two sides to organ donation. On one end, someone's prayers are answered and their life is saved, but on the other end, someone's life is tragically cut short. This film brings both sides of organ donation to the forefront in an effort to promote organ donation awareness. **MND**

**Victoria Resnick**

**Advisor:** Dr. Nadia Ansary  
**Title:** Perceived Discrimination and the Prevalence of Depression and Anxiety: A Study of Muslim Youth  
**Abstract:** With the influence of the events of September 11, 2001, Muslim youth have faced a new dimension of discrimination. These children have higher levels of depressive symptoms, significantly lower levels of self-esteem, and higher levels of academic stress. Limited research is available on this topic which is why this study is essential. This study was designed to examine the relationship between discrimination, depression, and anxiety in Muslim youth. A mixed-method approach was used: Surveys were used to gather quantitative data and focus groups were used to gather qualitative data. This data was compared to rates of depression, anxiety, and self-esteem levels to those of national norms. Other factors, such as religiosity as a buffer, self-esteem, and relationships with peers and parent were assessed. Three focus groups consisting of Muslims teens were also used to gather qualitative data that examined the idea of growing up Muslim in America and the perception of the events of September 11, 2001 in regard to their view of themselves. The focus group data was used to provide stronger information about the associations found in the quantitative data. **PSTR**

**Kerry Richman**

**Advisor:** Dr. Linda Materna  
**Title:** Federico García Lorca - A Painter With Words: Images of Nature and Color in Poetry and Theater  
**Abstract:** Federico García Lorca, through the use of nature and color references that are portrayed via simile, metaphor, and personification, creates highly visual works that reveal images that could easily be transferred to a painter’s canvas. As a painter with words, he uses nature and color images to expose not only contrasting themes such as life versus death, but to suggest such related sub-themes of sight versus sightlessness, fertility versus sterility, and eroticism versus repression. By examining select recurring elements of nature and the inclusion of specific colors in a selection of his plays and poetry, I am demonstrating the very visual nature of his art. This research and evaluative project, prepared and written in Spanish, covers

Diana Rojas

Advisor: Dr. Jonathan Karp
Title: Handling and Restraint Effects on Skin Inflammatory and Antibody Responses in Male C57BL/6 Mice

Abstract: The effects of handling and a psychological stressor (restraint) on cell-mediated (skin inflammatory) and humoral (antibody) immune responses were examined in male C57BL/6 mice. Handling alone generated a delayed cell-mediated response in comparison with non-handling which generated a normal U-shaped cell-mediated response. Restraining handled mice generated lower cell-mediated responses compared to restraining non-handled mice which created a higher cell-mediated response. This suggests that a type of coping-mechanism was formed throughout the previous handling period. ELISA’s were done afterwards in order to measure IgM and IgG antibody production. While restraining handled mice caused a higher anti-KLH IgM antibody response, it did not influence the production of IgG antibody. Subunits of IgG; IgG1 and IgG2a, were examined further and restraint appeared to have elevated IgG2a antibody response in handled mice. As both handled and non-handled mice did generate immune responses to anti-KLH, these data suggest that acute restraint stresses can cause an effect on immune responses only if the animals are handled. This further suggests laboratory animal handling should be taken into account as it may affect lab results. PSTR

Brenna Simonson

Advisor: Dr. Michael Brogan
Title: Lessons from Montreal, Kyoto, and Copenhagen: The Viability of Future Environmental Policies

Abstract: The issue of climate change became an international concern in the late 80s with the creation of the Intergovernmental Panel on Climate Change. Since that time several attempts have been made at creating international environmental policies aimed at combating climate change and reducing greenhouse gas emissions. Different aspects of each of these policies and conferences have been deemed both successes and failures by the international community. What then is required to establish effective policies that are able to span across sovereign territories in order to solve a global problem? This presentation will examine the details of the negotiations made at Montreal, Kyoto, and Copenhagen. From that, it is crucial for policy makers to analyze the best approach to instituting a global environmental policy and determine which measures must be included to make the policy as effective as possible. ENV

Nicole Singer

Advisor: Dr. Carol Brown
Title: The Impact of Leadership Training on Pre-service Teachers: a One Year Study of Teacher Leadership
**Abstract**: The purpose of the study is to examine whether leadership training can be beneficial to pre-service teachers. This study develops a leadership training module for the undergraduate student teaching seminar at Rider University. This study uses a mixed methods research approach. Qualitative data will be collected to evaluate the need for leadership training for pre-service teachers and the potential success of the intervention. A needs assessment will include Rider University graduates from the School of Education, Education professors, and school principals in the field. Leadership research and the data from the needs assessment will guide the development of the module. Four surveys will be issued at pivotal points of the study to assess the impact of the module. The findings of this study may have implications for Rider University’s School of Education regarding the potential for creating or incorporating specific leadership training for pre-service teachers in the future.

**Christine Sookhdeo**

**Advisor**: Dr. Daniel Druckenbrod  
**Title**: Effect of Forest Age and Past Land Use on Organic Carbon Content of Mount Vernon, VA Soils  
**Abstract**: Forest age and past land use both affect the amount of organic matter contained in soil. George Washington used his Mount Vernon plantation for the farming of various crops. Crop rotation, fertilizer application and mulching were used to increase soil fertility and field productivity. Different crops require different quantities of nutrients and therefore, depending on which crops were grown on a particular plot, the soil organic carbon (SOC) may vary across abandoned agricultural fields. SOC content of soil samples taken from forested areas may differ as older forested areas are expected to have higher SOC contents than younger forested areas since the soil has had more time to replenish nutrients lost. Replicate soil samples were taken from each of 14 plots across forest stands of varying age within the Mount Vernon property. The loss on ignition method was used to determine percent organic carbon. Soil samples were first dried overnight in a drying oven set at 105°C and were then placed in a furnace where they remained exposed to temperatures of 550°C for 4 hours. Both belowground biomass and SOC are estimated from these analyses and compared with estimates of forest stand age from tree rings. **PSTR**

**Jennifer Sorensen**

**Advisor**: Dr. Lucien Frary  
**Title**: New Currents of Fascism: Neo-Nazism in the Russian Federation  
**Abstract**: This project examines neo-Nazism in Russia since the fall of the Soviet Union in 1991. The central question concerns how Russia, a twentieth-century superpower, has become the home of half the world's active neo-fascist groups. In general, the subject of neo-fascism has been neglected by scholars. A tendency is to avoid the subject of neo-Nazi groups if possible, because awarding them exclusive consideration may suggest that such groups present a significant social force. Danger also resides in providing these groups with a forum for their own propaganda. However, the situation in Russia is an exception. Since the collapse of communism, Russia has become a dangerous place to live for ethnic minorities. Various neo-Nazi groups are
committing hate crimes at an intense rate, and leading Russian politicians have exhibited increasingly xenophobic behavior. The neo-Nazi movement has seeped into the political sphere, and has influenced major political parties like the Liberal Democratic Party of Russia (LDPR). This project will shed light on this tendency in Russian politics and society, a trend that has become too dangerous to ignore.

**URSA Recipient 2011-2012**

---

**Nicole Van de Vaarst**

*Advisor:* Dr. David Dewberry  
*Title:* Ketchup in American Culture  
*Abstract:* Food is a form of communication in America. People rarely consider that the food they eat (and do not eat) communicates something about themselves as well as the society they find themselves in. This concept is prevalent in the United States. There is one food that defines the American culture, and that food is ketchup. Ketchup is uniquely American as it bridges “traditional” American food such as hotdogs, hamburgers, and even French fries. Next to the universal salt and pepper, ketchup is the default condiment of America. Using a cultural studies approach, which emphasizes that the powerful control and influence culture while the less powerful can only absorb or reject what is presented to them, this paper argues that using ketchup is a widely accepted cultural practice in the United States and those who do not use it are often subjugated. CUL

---

**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 Recipient 2011-2012**

---

**Robert Weber**

*Advisor:* Dr. Laura Hyatt  
*Title:* The Effect of Nutrient Pulses on the Growth of the Common Reed, *Phragmites australis*  
*Abstract:* Nutrients are essential for the growth and development of plants.
However, the timing of the availability of nutrients is just as important as their presence, since plants from different environments will be adapted to different nutrient regimes. This becomes especially important when trying to control invasive species, as certain areas may be resistant to invasion by dint of having different nutrient availability than more susceptible areas. *Phragmites* is one such plant, and of particular importance as it tends to completely replace diverse native wetland environments with vast, monocultural stands of itself. The goal of this experiment is to determine the effect of differing nutrient concentrations and flow rates on the invasive common reed, *Phragmites australis*. In the greenhouse, plants were subjected to differing nutrient availability and quantities and their subsequent growth and response was measured. Our findings will increase understanding of what conditions are optimal for the growth of *Phragmites* and help target areas for control. The information from this study may also be applicable for the control of other invasive wetland species, such as reed canary grass (*Phalaris arundinacea*), and it may be possible to extend the finding to purple loosestrife (*Lythrum salicaria*) and invasive subspecies of *Spartina*. SCI

---

**Dawn Whetstone**

**Advisor:** Dr. Stephanie Golski  
**Title:** Do Traumatic Content and Trait Anxiety Influence Recall of Situations?  
**Abstract:** Hallmarks of post-traumatic stress disorder (PTSD) include heightened arousal and vivid recall or re-experiencing of traumatic events; but how do trauma and anxiety influence memory recall in the typical population? The aim of the present study was to examine the influence, if any, of trait anxiety, as assessed by the Beck Anxiety Inventory, on free and cued recall of scenarios that varied in degree of traumatic content. Data collection is ongoing; preliminary results will be discussed. PSTR
Jennifer Whiting

Advisor: Dr. Thomas Simonet
Title: Corporate and Social Elements of Photography in the Gas Drilling Industry
Abstract: The industrial revolution and modern photography share an intersection that has linked them from birth. Co‐joined twins, of sorts, these two modern developments—dependent upon mechanics, chemistry, physics and now digital technology—have affected the person, the city, the nation. This independent study analyzes the confluence of these two forces, seeking to understand how photography affects the interpretation of social and environmental issues as well as corporate identities in the gas drilling industry. The study is divided into three parts: history, composition and technical aspects, and emerging technologies.

Di Zhao

Advisor: Dr. Lindsey Christiansen
Title: Allure of the Unattainable: Themes of Lost or Unrequited Love in Early 20th Century German Lieder and Chinese Folk Song
Abstract: My goal is to analyze contrasting and recurrent themes of unrequited and lost love in the first half of the 20th century within two genres of music: German Lieder and Chinese folk song. In addition to studying the history and cultural ethos surrounding significant Lied composers I will also investigate examples of folk music from various regions of China. Topics to be discussed involve influences of traditional and contemporary culture upon the portrayal of courtship and the search for love, and how this manifests itself in the text or composition of a song through symbolism and stylistic attributes. I will perform 2-4 Lieder/folk songs to support my research.
URSA Recipient 2010-2011
ISCAP/URSA COMMITTEE 2011

Dr. Heather Casey (Teacher Education)
Dr. Brooke Hunter (History)
Ma Lei Hsieh (Moore Library)
Dr. Danielle Jacobs (Chair, Chemistry/Physics)
Dr. Shawn Kildea (Communication/Journalism)
Dr. Phillip Lowrey (Biology)
Dr. Sharon Morrow (WCC/Music Education)
Dr. Jerry Rife (Fine Arts)
Dr. Roberta Fiske-Rusciano (CCS/Political Science)
Dr. Jia Shen (Information Systems & Supply Chain Mgt)