

CURO Summer Research Fellowships

The Center for Undergraduate Research Opportunities (CURO) awards Summer Research Fellowships to academically talented undergraduates who participate in research during the summer term at the University of Georgia. The number of Summer Research Fellowships varies from year to year, based on funding. Successful applicants receive a financial award of \$3,000 and present their research at the CURO undergraduate research symposium. (Those students who receive \$3,000 must use \$500 toward presenting their research at a regional or national conference.)

In order to be selected for a Summer Research Fellowship, interested students must have at least a 3.4 GPA, thirty hours of UGA credit, and must commit to the following:

1. Enrolling in two sequential Honors undergraduate research courses: HONS 4960H and HONS 4970H or HONS 4970H and HONS 4980H. Students who wish to complete a thesis during the summer should check with Dr. Kleiber and their faculty research mentor. If approval is granted, the student will register for HONS 4980H and HONS 4990H. Students who are awarded the fellowship must register for these classes for the regular summer session before they are eligible to receive fellowship monies. If, during the course of the fellowship, the student withdraws from these classes for any reason, the stipend must be returned in full. CURO Fellows must resign from any other UGA employment to be eligible for funding and may not be enrolled in any other courses. CURO will create 6 hours of Honors research courses for the student in OASIS.
2. Submitting an abstract of the summer research to Dr. Pamela Kleiber by the last day of finals of the summer semester, for possible presentation at the annual CURO Symposium the following spring. Fellowship recipients are required to attend the upcoming Symposium, even if their abstract is not selected for presentation.
3. Participating in panel discussions with the Associate Director throughout the year to encourage an appreciation for undergraduate research at UGA.

Students who will be traveling internationally as part of their research must complete additional paperwork through CURO and the Office of International Education and are required to purchase travel insurance (approximately \$1 per day) through the Office of International Education for their time abroad.

2010 Selection Committee

Dr. Patricia Hunt-Hurst	Professor and Head, Textiles, Merchandizing and Interiors
Dr. John Maerz	Assistant Professor, Vertebrate Ecology
Dr. David Saltz	Professor and Head, Theater and Film Studies
Dr. Paul Schroeder	Professor, Geography
Dr. Michael Tiemeyer	Associate Professor, Biochemistry and Molecular Biology
Dr. Karen Webber	Associate Professor, Institute of Higher Education
Chair: Dr. Pamela Kleiber	Associate Director, Honors Program

Special thanks to the sponsors of the 2010 Summer Research Fellowships

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CURO 2010 Summer Research Fellowships

April 12, 2010

Dear UGA Faculty and Students:

We are delighted and honored to name 25 CURO Summer Research Fellows for 2010, each of whom is featured in this handbook with a summary of his or her faculty-mentored research project. The goal of the CURO Summer Research Fellowships is to provide opportunities for intensive, immersive, faculty-guided research experiences for academically talented undergraduates. The program advances the students' knowledge and abilities to think critically, solve problems, and contribute to greater understanding of the world.

The CURO 2010 Summer Research Fellowships are funded through the Honors Program, the President's Office, the Office of the Senior Vice President for Academic Affairs and Provost, the Office of the Vice President for Instruction, the Office of the Vice President for Research, the Alumni Association, the Athletic Association, and the Jane and Bill Young Scholarship.

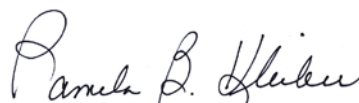
We are exceptionally proud of the quality of the contributions of present and past CURO Summer Fellows and with the mentorship of faculty researchers and their graduate students. The Summer Fellowship program has contributed to building a culture of undergraduate inquiry at the University of Georgia, and the CURO Summer Fellows serve as ambassadors, sharing their enthusiasm and expertise in a variety of professional forums on campus as well as at regional, national, and international meetings.

Please join us in congratulating these young scholars on the occasion of being awarded these prestigious fellowships. Please join us also in thanking the faculty research mentors whose support and guidance are crucial to the CURO Summer Fellows' success.

Sincerely yours,



David S. Williams
Director, Honors Program



Pamela B. Kleiber
Associate Director, Honors Program

CURO 2010 Summer Research Fellowships

2010 Summer Research Fellows

Alcorn, Jessica	6
Anukam, Amarachi	7
Bailey, Thomas	8
Bray, Michael.....	9
Caldwell, Ebony.....	10
Cassidy, Caitlin	11
Cauble, Meagan	12
Celluci, Daniel	13
Fazio, Jessica.....	14
Freeman, JoyEllen.....	15
Ghose, Debashis.....	16
Gregory, Camille.....	17
Hester, Shanterian	18
Mann, Georgianna.....	19
Naidu, Krelina.....	20
Parker, Rebecca.....	21
Patel, Jay	22
Perez, Rachel.....	23
Prior, Ryan	24
Rajeev, Malavika	25
Rogers, Hope.....	26
Rutherford, Carla	27
Smart, Laura.....	28
Thompson, Stephen.....	29
Young, Jake.....	30

Appendix A

2009 Summer Fellows	31
---------------------------	----

Appendix B

2008 Summer Fellows	34
---------------------------	----

Appendix C

2007 Summer Fellows	37
---------------------------	----

Appendix D

2006 Summer Fellows	40
---------------------------	----

Appendix E

2005 Summer Fellows	42
---------------------------	----

Appendix F

2004 Summer Fellows.....	44
--------------------------	----

∫ CURO 2010 Summer Research Fellowships ∫

Appendix G
2003 Summer Fellows47

Appendix H
2002 Summer Fellows50

Appendix I
2001 Summer Fellows52

Primetime Television News Coverage of the 2010 Tea Party Convention
Jessica Alcorn



During its dominance, television news was viewed as a relatively homogenous product, catering and marketing to a rather large audience. However, as new forms of media challenged broadcast, primarily satellite and cable, and the major networks fought to retain their audience level, observers noted that “news” was changing. Simply the introduction of greater competition, competition that seemed to target a particular slice of the market, changed the nature of news. Many scholars began to discuss news as filtered through a prism, rather than a “fair and balanced” representation of “all you need to know”. I will attempt to test this theory of niche news by analyzing the coverage of a rather politically charged event, the Tea Party Convention. If this theory is true, the expectation is that coverage among the major news outlets (ABC, CBS, NBC, FOXNews, MSNBC, and CNN) will differ significantly in their presentation. In the end, I expect variation in 1. How the Convention is framed, 2. How much attention is given to the event, and 3. The positive and negative connotations found in the words used to describe the event. I will conduct a content analysis of news transcripts from the days immediately surrounding the convention according to particular variables, such as sources, ideological bias, and attention. Most of the data analysis will be descriptive, with quantitative support from correlation and cross-tabulation analysis. My expectation is a confirmation of the niche theory. News no longer represents reality, but rather reality through a particular market perspective.

Research Faculty Mentor, Dr. Audrey Haynes, Department of Political Science

Healthy Teens: A Longitudinal study of ‘at risk’ secondary students
Amarachi Anukam



Healthy Teens is a project to examine the developmental pathways that students follow from 6th to 12th grade, especially in regards to dating violence, relationships with peers, academic success or failure, drug use, depression & suicidal thoughts, and dropping out of school. Although this list includes a broad range of behaviors, the main goal of this research is to prevent violence and aggression in youth by working with kids, families, and schools. This project has followed over 700 northeast Georgian students from 6th to 12th grade.

In middle school, students were recruited into the project in two ways. Most of the students were randomly selected, and these students make up the “random” group of participants. In addition,

some students were nominated by their teachers for being more aggressive towards their peers. These nominated students make up the “high-risk” group of participants, as they already show more aggressive and violent behavior than their peers. The students were surveyed every spring from 6th to 12th grade, but received slightly different surveys based on what group they were in. Surveys evaluated a wide variety of violence-related behaviors (aggression towards peers, delinquency, weapon carrying, drug & alcohol use), as well as a large number of risk factors and protective factors at multiple levels of the ecological framework

The ecological model states that there are different levels of interaction that influence behaviors of individuals. These levels are: child (the individual in question), family, peers, school, community, are society. At each level of the ecological model, protective factors promote healthy, nonviolent behaviors and risk factors enhance the likelihood of violence and aggression. For example, a protective factor at the family level is having a positive relationship with parents. In contrast, a risk factor at the family level is lack of parental supervision.

This summer, I will observe and analyze risk and protective factors of research participants at the neighborhood level. Under the guidance of a graduate assistant, I will be conducting neighborhood observations using an adapted version of The Neighborhood Observational Checklist (NOC) (Zenk, Schulz, House, Benjamin, & Kannan, 2005b). The Neighborhood Observational Checklist adapted for the study comprises 36 items that cover land use; street, sidewalk, and building conditions; alcohol, tobacco, and fast-food advertisements; residential housing; noise; and resident activity. I will use a handheld computer (Palm m125) to collect NOC data programmed in Experience Sampling Program (ESP) version 4.0 software, a system well suited for field-based observational research (Gravlee, Zenk, Woods, Rowe, & Schulz, 2006). All travel costs to and from the neighborhoods will be covered by the lab. After collecting data, I will use SPSS (a computer program used for statistical analysis) to examine disparities between the neighborhood environments of the students and compare self-reports of delinquency by neighborhood characteristics.

Faculty Research Mentor: Dr. Pamela Orpinas, Department of Health Promotion and Behavior

**Six Bodies: A Quantitative Analysis of Japanese Discourse
Features**
Thomas Bailey

A number of characteristics have been traditionally attributed to Japanese discourse by qualitative research. While this qualitative approach is not itself a problem, it is the responsibility of scholars to verify previous findings. To this end, I seek to *quantitatively* evaluate such attributions, while also developing a concrete understanding of such discourse features.

To this end, I will analyze six large collections of text (“corpora”) using three methods: comparing which words are found near each other (and how often), examining rates of appearance for certain words and fixed phrases, and directly examining context through the use of concordancing software.

Three of the corpora I use will be in English: the EMU corpus was created by myself and was taken from freely available online interviews with English-speaking musicians. The EJI corpus was also created by myself, and followed the same sampling procedure as the EMU corpus, though I sampled from interviews with Japanese musicians that had been translated into English. The third is the FROWN reference corpus, which is a million-word collection drawing from a large range of written sources and genres.

Three of the corpora will be in Japanese: the Corpus of Spontaneous Japanese and the Balanced Corpus of Contemporary Written Japanese are, like FROWN, reference corpora and were created by the National Institute for Japanese Language. The third will be a personally-constructed Japanese-language corpus designed similarly to the EJI and EMU corpora.

The reference corpora (FROWN, CSJ, BCCWJ) will permit me to compare general language use against my specialized interview corpora in order to account for the impact of genre, and the three interview corpora will be compared to yield insight into Japanese discourse features.

This research will prove significant because it seeks to assess accepted beliefs about Japanese speech, which impact wider attitudes towards the Japanese themselves. Furthermore, understanding of Japanese communicative patterns has major implications for international business. In inter-company relations where miscommunications are disastrous and costly, a thorough understanding of Japanese communicative practices is invaluable.



Faculty Research mentor: Dr. William Kretzschmar, Departments of English and Linguistics

Genetic analysis of pigmentation in *Drosophila tennebro*

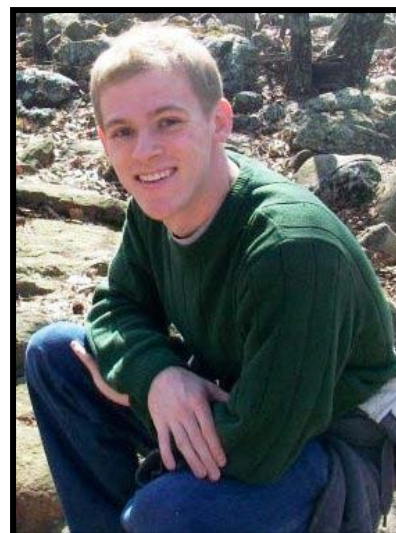
Michael Bray

The primary goal of this project is to identify the genes that underlie the dark diffuse pigmentation in *D. tennebro*. In the quinaria group of *Drosophila*, most species are yellow in body color, with distinct dark spots spaced around the abdomen. *D. tennebro* is the only member of this subgenus group that is melanic, in that it has a completely black abdomen. Because the majority of the quinaria group's coloration is yellow, the lighter trait is thought to be the ancestral trait. Thus, the dark abdomen of *D. tennebro* is thought to be the derived trait. I will make reciprocal crosses between male *D. tennebro* and female *D. suboccidentalis* and between male *D. suboccidentalis* and female *D. tennebro*. Since the male offspring will be sterile from the reciprocal cross, I will take the female offspring and backcross the hybrids to either male *D. suboccidentalis* or male *D. tennebro* for two generations. Because the dark diffuse abdomen is thought to be associated with the X chromosome from previous crosses, I will use genetic markers on the X chromosome from each species and test of each marker for an association for the dark diffuse abdomen. I will use two genes known to be involved in pigmentation on the X chromosome, yellow and omb (Wittkopp et al., 2003). To narrow down the candidate genetic region, we will also use eight markers that are not associated with pigmentation. If there is a statistical association between a marker and the dark abdomen, this suggests that this gene or a gene physically linked to it causes the derived trait to be expressed.

The effects of the dark pigmentation will be also studied by breeding the *D. tennebro* pigmentation gene into the *D. suboccidentalis* genome. This is important because pigmentation genes affect many phenotypes or traits. We will look at different traits previously thought to be associated with pigmentation. One trait that is correlated to pigmentation includes heat tolerance. Dark pigmentation of some *Drosophila* species tends to associate with higher altitudes where the coloration helps the flies absorb heat from the solar rays (Pool and Aquadro, 2007). Other traits that have been correlated with pigmentation that can be examined for this experiment are desiccation resistance, UV resistance, and behavior such as mating preference (Wittkopp and Beldade, 2009).

"Pigmentation is a rapidly evolving trait" (Ng et al., 2008), and a new mutation could significantly change not just one but many.

Understanding the genetic basis of pigmentation will help advance the scientific community to comprehend complex traits with more than one chemical pathway. It will hopefully enable us to understand how traits change and appreciate the remarkable diversity of the animal kingdom.



Ng, Chen Siang, Hamilton, Andrew M., Frank, Amanda, Barmina, Olga, and Kopp, Artyom. "Genetic Basis of Sex-Specific Color Pattern Variation in *Drosophila malerkotliana*." *Genetics* 180 (2008) 421-429

Pool, John E., and Aquadro, Charles F. "The genetic basis of adaptive pigmentation variation in *Drosophila melanogaster*." *Molecular Ecology* 16.14 (2007) 2844-2851

Wittkopp, Patricia J., Carroll, Sean B., and Kopp, Artyom. "Evolution in black and white: genetic control of pigment patterns in *Drosophila*." *Molecular Biology and Genetics* 19.9 (2003) 495-504

Wittkopp, Patricia J., Beldade, Patricia. "Development and evolution of insect pigmentation: Genetic mechanisms and the potential consequences of pleiotropy." *Seminars in Cell & Development Biology* 20.1 (2009) 65-71

Faculty Research Mentor: Dr. Kelly Dyer, Department of Genetics

Influences on the outlook of the post-college educational opportunities and choices of undergraduate science majors

Ebony Caldwell



Women and members of some racial and ethnic groups are under-represented in the fields of science, medicine, and public health. This disparity is even more present at the faculty level, where minority representation is only 5%, despite the US population of minority groups being over 30%. However, before these faculty members even enter the workforce, they are influenced by a myriad of influences as undergraduate students that influence their future employment and educational decisions. How undergraduate students reason through their post-college educational opportunities and choices is the focus of this study. Ten UGA undergraduate science majors will be recruited through snowball sampling, and through a semi-structured interview protocol, the students will be asked how they think about their academic and professional futures. This data will then serve as basis for qualitative analytic work exploring how gender, race, and ethnicity may affect perceptions of opportunities and likelihood of success for students at the undergraduate level.

Faculty Research Mentor: Dr. Monica Gaughan, Department of Health Policy and Management

The Art of Persuasion: How Small Business Owners Use Speech to Market Products in Roswell, GA
Caitlin Cassidy



The field of linguistics is one that is not often explored within the context of marketing and business management. Rather, its study is most often confined to analysis of historical languages and language acquisition, leaving little room for discoveries in the art of modern communication. Roswell Voices, a program designed to create a partnership between the Roswell Convention and Visitors Bureau (CVB) and academic researchers at the University of Georgia, began in 2002 as a means of associating community development efforts with the historical and contemporary language of the area. Under the direction of Dr. William Kretzschmar, the project is currently in the application process (attached) to become a member of the European Network of Living Labs (ENoLL, www.openlivinglabs.eu), a program under the umbrella of the European Union, designed to “develop and offer a gradually growing set of networked services to support the ‘Innovation Lifecycle’ for all actors in the system: end-users, SME’s, corporations, public sector and academia.” Roswell would be the first U.S. member of EnoLL, and membership would add a more commercial aspect to ongoing “service learning” and research cooperation between Roswell and the University. My research

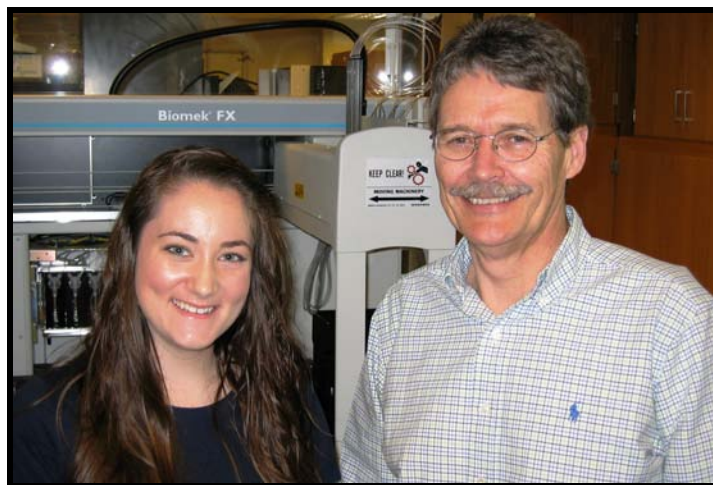
will not only strengthen the partnership created between the city of Roswell and the University, but will also open doors to discoveries in the field of sociolinguistics, with regard to how speech can be used as a business strategy.

The primary objective of this research is the identification of patterns in communication that characterize new members of the business community and allow for their success in the free market. I will look for characteristics that help to establish credibility as an entrepreneur and as a provider of goods and services. The process will begin with recorded, personal interviews of six volunteers from the Roswell community, recruited through the Roswell CVB who have come to Roswell from abroad and started businesses. As part of the recruitment process, I will research the different immigrant communities that have come to Roswell and now do business there. Included in the survey (attached) are questions related to personal information, observations of the history and daily life of Roswell, pronunciation of common words, and various regional terms. I will transcribe each of the interviews, and then review them to discover specific themes in the speakers’ process of integration with the Roswell community and conducting business there. In particular, I will be counting the occurrence of certain phrases or sounds already being studied in Roswell, especially aspects of southern speech historically present in Roswell, and comparing the speech of the subjects with what is known about other Roswell residents. I believe that a new understanding of the integration of new international residents and their businesses will emerge and give the community of Roswell a means of improving communication between buyers and sellers, ultimately helping the local economy to continue grow and prosper.

Kretzschmar, William A. Linguistic Atlas Projects N.p., 26 Mar. 2005. Web. 10 Feb. 2010. <<http://www.lap.uga.edu/copyright>>. Open Living Labs Ed. Els Sevenants. European Network of Living Labs, 1 Dec. 2009. Web. 10 Feb. 2010. <<http://www.openlivinglabs.eu/>>.

Faculty Research mentor: Dr. Bill Kretzschmar, Department of English

**Mechanism of plant biomass conversion without pre-treatment by anaerobic thermophilic bacterium
Caldicellulosiruptor bescii
Meagan Cauble**



Converting plant biomass into ethanol and other fuels shows great promise for minimizing the consumption of gasoline and decreasing pollution to the environment. *Caldicellulosiruptor bescii* is an anaerobic thermophile that can grow on untreated plant biomass at high cell densities and can degrade plant biomass to release hydrogen, which is an alternative energy source. However, the mechanism for this process is not clear. *C. bescii* has optimal activity and growth at 75°C. The utilization of this organism for the production of biofuels would decrease contamination by other microorganisms because of the high temperature. Furthermore, the enzymatic reactions required for the degradation of plant biomass can be done at high speeds because the rate of cellulose degradation increases with temperature.

In this project, I will study the mechanism that *C. bescii* uses to degrade cellulose and polysaccharides. I will grow the organism on various types and combinations of plant biomass, such as switchgrass, poplar, and peanut shells, among others. The cell density of *C. bescii* in cells per milliliter will be calculated on various patterns of plant biomass. I will estimate the amount of substrate conversion by the organism and evaluate the chemical and structural composition of plant biomass both before and after the organism was grown on the substrate. Furthermore, I will determine what metabolites accumulated on plant biomass of different compositions after the organism was grown. Also, I will compare the efficiency of polysaccharide and plant biomass conversion by *C. bescii* intact cells and by isolated extracellular enzymes produced by the growth of *C. bescii* on different substrates. I will do this by isolating the extracellular proteins by protein SDS electrophoresis and measure the hydrolytic activity of these enzymes in comparison to the activity of *C. bescii* cells. This data will give insight into the mechanism of plant biomass conversion by *C. bescii* and demonstrate what types of plant biomass the organism most efficiently uses.

Faculty Research mentor: Dr. Mike Adams , Department of Biochemistry and Molecular Biology

Applications of Molecular Dynamics Simulations to Models of Gas-Grain Interactions in the Interstellar Medium

Daniel Cellucci

In Astrophysical simulations involving the early formation of stars and solar systems, much of the behavior of the system is dependent upon the interactions between gas molecules and larger, amorphous conglomerates of ice and dust. Though these interactions are integral to the understanding of the system as a whole, the details regarding the interchange between the gas and the larger particles have been treated mainly with over-simplified models that neglect important physical behaviors only accessible through atomistic simulations of realistic systems. The proposed research seeks to provide far more accurate and richly detailed information about gas-grain interactions by examining the systems at the molecular level. In particular, this research will predict the sticking coefficient for various gas-grain combinations. The sticking coefficient measures the probability that a gas atom or molecule incident on an ice or dust grain will stick to the surface rather than scatter back into the gas phase. This parameter is a function of both the grain temperature and the kinetic energy of the incident gas molecule. Since many important chemical and physical reactions in the interstellar medium are catalyzed by ice and dust grains, a detailed understanding of the capture probability for reactants by the grains is essential for accurate, predictive models of interstellar environments and star-forming regions.

The objectives of this research are twofold. Initially, the goal will be to create an effective simulational framework involving the test case of atomic hydrogen interacting with amorphous water ice and to be able to calculate the sticking coefficient for this system. After these preliminary computer experiments have been successfully performed and compared to previously published results, the framework that will have been developed by the initial tests will be expanded to include grains other than amorphous water ice, and other gas species such as carbon, oxygen, nitrogen, sulfur, methyl, hydrogen cyanide and formaldehyde.



In order to accomplish these objectives, multiple programming and simulational tools will be employed. Namely, the scripting language Ruby will be used to generate the atomistic model of the amorphous ice grain to be used in the gas-grain scattering simulation. Using this information, a series of randomized trajectories for the possible collisions between the gas molecule and the solid will be calculated using the LAMMPS Molecular Dynamics Simulator. These trajectories will then be averaged over multiple separate simulations involving different initial conditions to allow for a precise estimation of the sticking coefficient for a given grain temperature T and gas kinetic energy K . The full T - K dependence of the sticking coefficient will be mapped out by repeatedly following the above procedure for various (T, K) pairs.

Research of this kind will significantly improve the way gas-grain interactions are treated in models of cool astrophysical environments. Additionally, the frameworks and the scripts being generated for this project will be capable of being applied in a variety of contexts, not the least of which includes a further exploration into different specific gas-grain combinations. Although the research in question will seek to provide the sticking coefficients for many elements common in the interstellar medium, there are a multitude of different combinations that will not be explored in this project that could, nevertheless, be readily computed by later research students who have been trained to use the tools resulting from this research project.

Faculty Research Mentor: Dr. Steven Lewis, Department of Physics

Carvone Luche Reduction Followed by Optical Activity Determination
Jessica Fazio

At the University of Georgia, the organic chemistry students are repeatedly given the same unknowns every year per each laboratory experiment. After having decided to take action to reverse this, the chemistry department is determined to work toward a direction of providing multiple, yet similar, unknowns. The inclusion of several unknowns within an experiment allows for each group in a class to be given different reagents for a reaction. This pushes them to be held accountable for truly learning more about the chemistry behind their experiment.

To begin this change, the implementation of a Luche reduction experiment should take place. Currently, there is an experiment that is performed using the reagent isoamyl acetate. This is the infamous “banana lab” that causes a nauseating aroma of bananas that lingers for days in the halls of the chemistry building. It is presently on the drawing board to perform the Luche reduction with a chemical that is called carvone. Carvone naturally forms two enantiomers, or mirror images. The first, *S*-(+)-carvone gives off the aroma of dillweed. Its mirror image, *R*-(-)-carvone, smells of spearmint (McMurry 24). The idea is to isolate the *R*-(-)-carvone enantiomer, which is then to be reduced using sodium borohydride and cerium chloride to make two diastereomers via the Luche reduction. Diastereomers are stereoisomers (molecules with the same chemical formula that vary electronically, often giving them different properties) that are not superimposable mirror images, enantiomers (McMurry 302). Since carvone has three double bonds that are capable of being reduced, the sodium borohydride and cerium chloride allow for the reduction to be regiospecific in choosing the explicit point desired for the reduction (Gemal and Luche 1981).



The basics of the experiment are not the changing factor of the laboratory design. However, a notable laboratory experiment involving the finding of optical activity of a reduction reaction has yet to be found. The products of the Luche reduction contain chiral centers which simply means that on at least one carbon, the four substituents are all different. Optical activity is a property that is seen in a chiral species when it rotates the plane of a transmitted beam of polarized light. (McMurry 295). The use of an instrument called a polarimeter allows the investigator to determine the optical activity of his product. This, in turn, if knowledge of the optical rotation of each pure individual diastereomer is known, allows the experimenter to calculate the percentage of each diastereomer contained within his product.

If the students are given different concentrations of the starting reagent, they will then have the results of varying optical rotations. After performing the optical rotation with the polarimeter, they will then be able to back calculate to determine the concentration of the starting reactants that they had been given initially. These concentrations will be known only to the instructor who will then be able to verify the results of each lab group individually.

This experiment proves to be important in multiple ways. First, it changes the original reaction used in the Luche reduction. Next, it implements the uncommon finding of optical activity of reduction reactions and is able to include several unknowns to keep the results among laboratory groups varied. Finally, it moves away from the intense aroma of the bananas toward the scent of spearmint, as long as the *R* enantiomer is the one isolated!

Gemal, Andre L. and Luche, Jean-Louis. “Lanthanoids in Organic Synthesis. 6. The Reduction of a-

Enones by Sodium Borohydride in the Presence of Lanthanoid Chlorides: Synthetic and Mechanistic Aspects.” *Journal of the American Chemical Society* 103.18 (1981): 5454 – 5458.

McMurry, John. *Organic Chemistry*. Ed. Kiselica, Sandra. Belmont: Thomson Higher Education, 2008.

Faculty Research Mentor: Dr. Richard Hubbard, Department of Chemistry

Georgia Slaves in Transatlantic Culture: Blind Tom and William and Ellen Craft
JoyEllen Freeman



As a CURO Apprentice for the 2009-10 academic year, I have had the opportunity to research how the Civil Rights Movement shaped the United States socially, politically, and psychologically during the twentieth century. This summer, I would like to step back one hundred years and delve into the world of American slavery. If I receive the Summer Research Fellowship, I will independently research the life of one extraordinary slave and pianist named Thomas Bethune, otherwise known as “Blind Tom” (1848-1908). Now recognized by scholars as autistic, Blind Tom was a musical prodigy born into slavery in Columbus, Georgia. Exhibited as a freak and a genius, he performed throughout the United States, Europe, and South America. I will write a scholarly essay examining what his life tells us about attitudes towards race, intelligence, gender, and disability during the nineteenth century. Within my paper, I will also compare

his experiences with other nineteenth century humans who were showcased for their bizarre physical characteristics, including Saartjie Baartman (the “Venus Hottentot”), Ota Benga the pygmy, and the Siamese twins Chang and Eng Bunker.

Studying Blind Tom will be a particularly enriching experience because he is from Columbus, Georgia, which is the city that I have been researching this year for the *Civil Rights Digital Library*. Also, I played the piano for nine years, and my musical background will help me to interpret his repertoire and compositions as clues into his life. I plan to use the *Thomas Bethune/Thomas Wiggins/Blind Tom Collection* which includes multiple pages of sheet music and nineteenth century news articles. I will trace notices and reviews of Blind Tom’s concerts from the Georgia Historic Newspapers microfilm and use periodicals from the Hargrett Rare Book and Manuscript Library such as *Harper’s Magazine* and *Frank-Leslie’s Magazine*. I will also utilize biographical information in both archival and modern books published about Blind Tom that are available in the main library. Finally, to think about Blind Tom in the context of nineteenth-century race relations and science, I will research the scientific claims of superior/inferior races made by early eugenicists such as Louis Agassiz and Samuel Morton in *Types of Mankind* (1855), as well as theories of race and disability by contemporary scholars such as Rosemarie Garland Thomson.

In addition to conducting my independent research project, I will assist Dr. Barbara McCaskill with her single-authored book entitled *A Thousand Miles for Freedom: William and Ellen Craft in the Transatlantic World*. Her work depicting the lives of two fugitive slaves from Georgia will expose me to research methods for studying American slavery. My assistance with Dr. McCaskill’s book will help me to further understand my work on Blind Tom and introduce me to the steps necessary for developing a scholarly book. To help move Dr. McCaskill’s book towards publication, I will check factual information and research appropriate illustrations for the book using scholarly articles, maps, photographs, and images from contemporaneous newspapers and magazines.

The CURO Summer Research Fellowship will provide me with the opportunity to investigate and study an individual’s life story within the context of larger cultural, social, and intellectual forces affecting it. My work both on Blind Tom and on Dr. McCaskill’s subjects William and Ellen Craft will give me a comprehensive understanding of what it meant to be an African American during nineteenth-century American slavery.

Faculty Research Mentor: Dr. Barbara McCaskill, English

Engineering *Saccharomyces* Yeast Strains to Better Ferment Pine Wood Biomass to Ethanol
Debashis Ghose

Ethanol is a possible replacement for gasoline as the major transportation fuel. Switching to biofuels would lessen the human contribution to greenhouse gases since the emissions produced when the fuel is burned is offset by the carbon sequestered in growing new feedstock. Since this fuel could be made locally, it would help the United States possibly gain more energy independence by reducing our dependence on foreign oil for transportation fuel. Ethanol is produced by fermenting organisms such as the yeast strain *S. cerevisiae*, which use the sugars in their surrounding environment for cellular processes. The two major sources for ethanol production in the world are corn in the United States and sugar cane in Brazil (1). Using these sources as feedstocks could create a slight competition between ethanol production and food supply, increasing food prices world-wide. One possible solution to this problem would be to use a feedstock that is not fit for human consumption, such as lignocellulosic biomass.



Pine wood is an inviting source of biomass from which ethanol can be created since it can grow in different environments making it a possible feedstock for many parts of the world. It also would not compete with food sources meaning food prices would be unaffected. Finding or creating a yeast strain which specializes in fermenting pine wood could help ethanol fermentations using pine as feedstock. One such strain has been produced by our lab, AJP50, by exposing its parent strain, ADY, to pretreated pine wood.

Ethanol production from biomass is impeded by inhibitory compounds released from biomass that is pretreated. The three main classes of inhibitors are: aromatics, weak acids, and furan derivatives; they can slow the growth rate of the yeast, inhibit cellular metabolism, and possibly cause cell death (3). Removing these toxins before fermentation is an undesirable solution since it would only add to the cost of ethanol production (2). AJP50 is possibly more resilient in surviving these inhibitors, and may even be able to convert them into less toxic forms faster than its parent strain ADY. Currently it remains unknown what genetic changes may have caused this difference in fermentation ability, however if they were known this knowledge would be useful in further engineering the strain to be even better at converting pine wood into ethanol. If I receive the summer fellowship my experiments would involve using methods to determine the differences in phenotype of different strains derived from AJP50. I would also assist in the creation of these derivative strains. Experiments using a Bioscreen C machine have already been done to generate growth comparisons between ADY and AJP50 in a variety of conditions. The growth and ethanol production data collected thus far indicate that AJP50 is able to outperform ADY at the equal cell level. Development of improved protocols for Bioscreen C experiments would allow for rapid characterization of future strains. It would also allow for rapid testing of a variety of conditions related to biomass fermentations. Successfully engineering derivative strains of AJP50 to ferment pine wood efficiently may significantly contribute to a move from a fossil fuel based economy and help the United States gain greater energy independence.

References:

1. Lin, Y., and S. Tanaka. 2006. Ethanol fermentation from biomass resources: current state and prospects. *Appl Microbiol Biotechnol* 69:627-42.
2. Palmqvist, E., and B. Hahn-Hägerdal. 2000. Fermentation of lignocellulosic hydrolysates. I: inhibition and detoxification. *Bioresource Technology* 74:17-24.
3. Palmqvist, E., and B. Hahn-Hägerdal. 2000. Fermentation of lignocellulosic hydrolysates. II: inhibitors and mechanisms of inhibition. *Bioresource Technology* 74:25-33.

Faculty Research Mentor: Dr. Joy Doran-Peterson, Department of Microbiology

Creating a transgenic mouse to study the physiological role of Hirano bodies in the progression of Alzheimer's disease

Camille Gregory

Since their discovery in 1968, Hirano bodies have been found in a multitude of neurodegenerative diseases and conditions including Alzheimer's disease, amyotrophic lateral sclerosis, Pick's Disease, Parkinson's Disease, and chronic alcoholism^{1,2,3,4}. These structures develop in the brain due to normal aging as well, but their incidence in Alzheimer's Disease is much higher³.

Although Hirano bodies were discovered decades ago, their function in the brain remains unclear since previous research has been limited to postmortem brain samples. Dr. Fechheimer and Dr. Furukawa's laboratory have created a model system in which to study Hirano bodies in living cells. It is believed that Hirano Bodies are not detrimental to neuronal function and in fact may play a protective role in the body's response to Alzheimer's Disease⁵.



My role this summer will be to create a transgenic mouse that has Hirano Bodies and Alzheimer's Disease in order to study the physiological role of Hirano bodies in the disease. The protein CT-GFP (CT-carboxy terminal amino acids 124-295 of the 34 kD actin binding protein fused to green fluorescent protein (GFP)), when expressed in sufficient quantities, has been shown to induce Hirano Bodies in mice. Previously, the Rosa-26 promoter, a weak promoter that is expressed throughout the body, was used to drive CT-GFP expression in mice. However, this mouse had beta galactosidase with flanking loxP sites upstream of CT-GFP. The beta galactosidase had to be excised from the DNA for the CT-GFP to be expressed. To this end, the Ros-26 mouse was mated with a mouse expressing cre recombinase using the Thy 1.2 promoter. Cre recombinase cleaves the beta galactosidase at

the loxP sites, and the Thy1.2 promoter is neuron specific in mice⁶. This allowed for CT-GFP expression in the brain alone. The resulting mice formed Hirano bodies after about six months, simulating an aging mouse⁶.

Due to the complicated genetics of this process, it would be simpler to design a mouse that forms Hirano Bodies without the extra cleavage step from cre recombinase. I will be designing DNA with the Thy 1.2 promoter directly driving CT-GFP expression in the neurons. This DNA will be injected into the pronucleus to produce several founder lines of mice. From a portion of the tails, I will prepare genomic DNA in which to conduct polymerase chain reaction and southern blot tests to determine which founder mice contain Thy1.2- CT-GFP DNA. I will also carry out western blot analyses on brain samples to select the best founder mouse for the transgenic lineage. The mouse that expresses the most CT-GFP will be ideal because it should form the most Hirano bodies.

To determine the physiological role Hirano bodies play in Alzheimer's disease, the chosen founder will be crossed with an Alzheimer's disease model mouse. This mating will produce mice that create Hirano bodies and develop Alzheimer's disease in a time dependent fashion. The resulting transgenic mice will be characterized through tests of learning, neuropathology, and electrophysiology using the Alzheimer's Model mice, the Hirano Body mice without Alzheimer's, and wild type mice as controls.

¹ Hirano, A., Hirano bodies and related neuronal inclusions. *Neuropathol Appl Neurobiol* **20** (1), 3 (1994).

² Schochet, S. S., Jr. and McCormick, W. F., Ultrastructure of Hirano bodies. *Acta Neuropathol* **21** (1), 50 (1972).

³ Hirano, A., Dembitzer, H. M., Kurland, L. T., and Zimmerman, H. M., The Fine Structure of Some Intranuclear Alterations. *J. Neuropathol. Expt. Neurol.* **27** (2), 167 (1968).

⁴ Schmidt, M. L., Lee, V. M., and Trojanowski, J. Q., Analysis of epitopes shared by Hirano bodies and neurofilament proteins in normal and Alzheimer's disease hippocampus. *Lab Invest* **60** (4), 513 (1989).

⁵ Ha, S., Furukawa, R., Stramiello, M., Wagner, J., and Fechheimer, M., Transgenic Mouse Model for the Formation of Hirano Bodies. In press, 2010.

⁶ Caroni, P., Overexpression of growth-associated proteins in the neurons of adult transgenic mice. *Journal of Neuroscience Methods* **71** (3-9), 47 (1996).

Faculty Research Mentor: Drs. Marcus Fechheimer & Ruth Furukawa, Department of Cellular Biology

**Exercising glycoproteomics analyses to discover new breast cancer
CURO-Jane and Bill Young Scholarship Summer Fellow: *Shanterian Hester***



Breast cancer is the second leading cause of women for cancer deaths in the United States. Although there are over 200,000 new cases of breast cancer each year, currently there is still not a serum based markers approved for the screening and diagnosis of breast cancer. The discovery of new biomarkers for breast cancer would enhance the current methods used for diagnostics and monitoring the course of the disease, such as mammography and physical examination. In addition, new markers could allow for better prediction of the disease that may reoccur in patients. Lastly, the detection of biomarkers in breast cancer may possibly lead to new therapeutic inventions to prevent the disease from spreading in patients.

Glycosylphosphatidylinositol-anchored proteins (GPIP) are a posttranslational modification that anchors a modified protein onto the surface of the cell membrane. The synthesis of GPI anchored proteins goes through approximately 20 enzymes, with one of them being GPI transamidase (GPIT), which adds the GPI anchor to the C-terminus of the protein. Preliminary studies have shown GPIT is over expressed significantly in breast cancer. In addition GPI-PLD, another enzyme discovered for the responsibility of cleaving GPIP, was found at high levels in human serums and shown to be expressed at elevated levels in several cancer cell lines. Prior studies have shown a new methodology of alpha toxin can be used as an effective method for identifying some of the GPIP released into the serum. Hence, this summer we plan to utilize new methodologies and technologies to exercise glycoproteomics analyses on breast tissue for the discovery of new markers. We want to use a siRNA sequence to knock down the expression level of GPI-PLD to cause an increase in GPIP on the cell membrane. With the relative number of GPIP identified as potential biomarker implies these elevated levels or the increased release of GPIP from cell surface into the serum insinuates their function is relevant to tumor cell survival. Isolating the GPIP released from breast cancers into sera will hopefully allow for identification of specific GPIP and their examination as a potential biomarker for breast cancer.

Faculty Research Mentor: Dr. Michael Pierce, Complex Carbohydrate Research Center

Bufo marinus Pathogen and Parasite Analysis as a Model for Ecosystem Change
Georgianna Mann

There is evidence that populations of *Bufo marinus* have been declining simultaneously with a rise in the alteration of their natural wetland habitats. It is very possible that this decrease in population is a direct result of environmental change and pollutant inputs. As part of a larger study by Master's student Kristy Segal in the Odum School of Ecology, I will assess the impact of land use changes on *Bufo marinus*, or the cane toad, by using pathogen and parasite burden as an indicator of population health. Amphibians in rice fields are exposed to several stressors they would not ordinarily encounter, such as agrochemical use. These stressors may translate to an important difference in habitat quality. By studying the pathogen and parasite burden of cane toads along a gradient of anthropogenic influence (natural wetlands, organic rice fields and conventional rice fields), I will be able to determine: 1) if rice fields can be a long term surrogate habitat for cane toads, and, 2) if cane toads can serve as an appropriate sentinel species for land use changes in the Rio Tempisque Basin. The following data will be collected: 1) morphometric measurements, 2) body mass, 3) gender, 4) biological samples (blood and feces). The primary pathogens and parasites of interest are: *Batrachochytrium dendrobatidis* (Bd), ranavirus, *Rhabdias spp.* and intestinal helminths. Microscopic analysis of blood and fecal smears will determine presence and identification of hemo- and endoparasites, and polymerase chain reaction (PCR) skin swabs will detect Bd and ranavirus tissue samples. I predict that the *Bufo marinus* inhabiting anthropogenically altered habitats will harbor a higher prevalence and diversity of selected pathogens and parasites. Thus, I further predict that I will see a positive correlation between the use of pesticides and this effect.



If *Bufo marinus* proves to be an appropriate sentinel species, other research activities associated with the Rio Tempisque Project will be able to use parasite and pathogen abundance as indicators of environmental change. This would provide a relatively simple, yet sensitive, method to monitor ecosystem health. In addition, this data will directly inform researchers and land managers of the wellbeing of cane toads in the Rio Tempisque Basin, which may be extrapolated to other amphibian species that also rely on wetlands for part of their life cycle. This could have important management implications for land use regulations and rice farming practices.

- Daszak, P., L. Berger, A. A. Cunningham, A. D. Hyatt, D. E. Green, and R. Spears, 1999. Emerging Infectious Diseases and Amphibian Population Declines. *Emerging Infectious Diseases* 5: 735-748.
- Duré, Marta I., Arturo I. Kehr, Eduardo F. Schaefer and Federico Marangoni, 2008. Diversity of Amphibians in Rice Fields from Northeastern Argentina. *Interciencia* 33: 523-527.
- Jimenez, Jorge A., E. Gonzalez and J. Mateo-Vega (Eds). 2001 Perspectives for the Integrated Management of the Tempisque River Basin, Costa Rica. 1st. ed. San José, C.R. : Organization for Tropical Studies, 2001. 24 p.
- Paton, Peter W. C., and William B. Crouch III, 2002. Using the Phenology of Pond Breeding Amphibians to Develop Conservation Strategies. *Conservation Biology* 16: 194-204.
- Zug, G. R., and P. B. Zug, 1979. The Marine Toad, *Bufo marinus*: A Natural History Resume of Native Populations. *Smithsonian Contributions to Zoology* 284: 1-58.

Faculty Research Mentor: Dr. Sonia Hernandez, Warnell School of Forestry and Natural Resources

Epigenetic Effects of Bromate on p21 and Histone-2AX Expression in HEK293 Cells
Krelin Naidu



The epigenetic effects of bromate (BrO_3^-) exposure in human embryonic kidney 293 (HEK293) cells were investigated. BrO_3^- is a byproduct of ground water disinfection procedures (ozoneation). It has been designated a possible human carcinogen by the International Agency for Research on Cancer. BrO_3^- treatment (10 – 200 ppm) causes damage to HEK293 cells based on cell death assays and significant increases in specific regulatory proteins (p53, p53, cdc2, etc.) in HEK 293 cells over 72 hours. Additionally, bromate induced epigenetic changes were assessed by increased expression of phosphorylated histone-2AX (H2AX), a histone correlated with DNA damage that facilitates DNA repair. BrO_3^- exposure also led to a G2/M cell cycle arrest that correlated to increased expression of tumor suppressor gene, p-p53, and other regulatory genes p-p38, p21, cyclin B1 and p-cdc2. Treatment of cells for 48 hour low concentrations (1 – 100 ppm) showed similar trends in protein expression levels. This suggests that bromate's toxicity may lead to epigenetic alterations. To confirm the epigenetic changes, methylation specific PCR after bisulfite conversion will be conducted to assess the suspected methylation of specific cell cycle regulation proteins such as p21. Preliminary studies demonstrate that bromate treatment of human embryonic kidney 293 cells alters the methylation status of p21 and increases in the phosphorylation of H2AX. These modifications in DNA methylation and histone expression levels support the hypothesis that bromate, at low levels, induces epigenetic changes in both in vivo and in vitro models of toxicity.

Faculty Research Mentor: Dr. Brian S. Cummings, Department of Pharmaceutical and Biomedical Sciences

Effects on Blood Flow Velocity and Arterial Diameter Produced by Compression Therapy in SCI Individuals

Rebecca Parker

Introduction

Exercise is essential for human health. Chronic conditions like diabetes, obesity, hypertension and other cardiovascular risk factors are counteracted by exercise. However, some individuals are unable to exercise due to injury or disease, and their vascular health declines (4, 2). Cardiovascular disease is the leading cause of death in spinal cord injury (SCI) populations (5). Hence, the target population for this study is individuals with SCI. Compression therapy improves discomfort in limbs which suffer from edema (1). Compression therapy may also improve vascular health by increasing venous blood flow. By increasing blood velocity, people may be able to attain health benefits similar to moderate exercise such as walking (3).

Findings from my previous research in able-bodied subjects suggest that "muscle pump" compression with pressures of 90mmHg applied every 5 seconds produces a beneficial vascular response. Increases in diameter observed after compression therapy measure within the expected magnitude for changes in flow-mediated dilation (FMD) in the femoral artery. FMD is a measure of a healthy vascular response, which is often due to increased blood flow and/or release of nitric oxide (6).

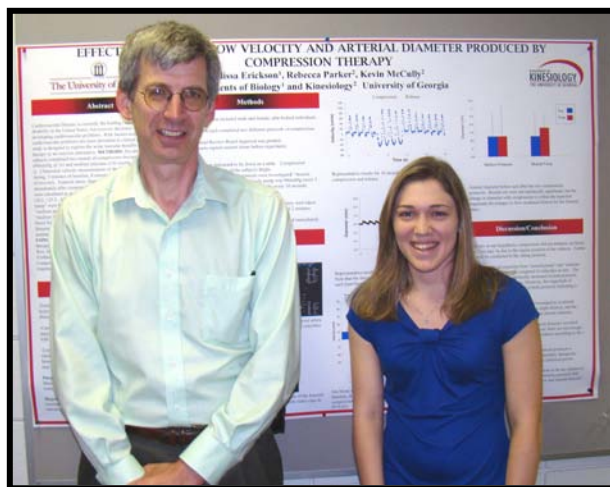
Intent

The purpose of the study is to continue my previous research that investigates the effects of compression therapy on arterial blood flow. This study also involves the investigation of arterial diameter change, which may be an effect of compression therapy.

Significance

As a summer research fellow, I will spend the first few weeks in preparation at the Vascular Biology lab at UGA. The heart of the study will be completed at Shepherd Center in Atlanta. This will allow me to have greater access to my target population of individuals with SCI. Working at the Shepard Center will also allow me to extend the partnership of the University of Georgia with the rehabilitation center.

In the fall, I hope to combine my findings at the Shepherd Center with my previously completed research and develop an Honors Thesis. If Compression Therapy appears to produce significant vascular benefits, then we can look toward the production of our device as a portable unit for outpatient therapy.



References

1. Amsler F, and Blattler W. *Eur J Vasc Endovasc Surg* 35: 366-372, 2008.
2. Hannan JL, Maio et. al. *J Sex Med* 6 Suppl 3: 254-261, 2009.
3. Manfredini F, et. al. *Circ J* 72: 946-952, 2008.
4. Shah SJ, et. al. *Circ Heart Fail* 2: 278-286, 2009.
5. Svircev JN. *Phys Med Rehabil Clin N Am* 20: 737-747, 2009.
6. Black MA, et al. *Am J Physiol Heart Cir Physiol* 297: H1109-1116, 2009.

Faculty Research Mentors: Dr. Kevin McCully, Department of Kinesiology

Characterization of Striated Fiber Assemblin Proteins in *T. gondii*

Jay Patel

Toxoplasmosis is an infection caused by *Toxoplasma gondii*, an obligate intracellular parasite known to infect humans and other animals. Infection in humans commonly occurs by consumption of undercooked meat containing tissue cysts of *T. gondii* or by taking in oocysts, the resistant stage of the parasite that can travel through various environments. Luckily, many cases of Toxoplasmosis are asymptomatic regardless of what stage infects the host. However, infection in immunocompromised people presents severe symptoms that can lead to death. From 1999-2004 the National Health and Examination Nutrition Study (NHANES) national probability sample found that approximately 11% of men and women in the United States were infected by *T. gondii*. [1]. Most carriers of the parasite do not undergo treatment, but the patients that acquire critical symptoms require medical attention. Current treatments for toxoplasmosis include an anti-malarial drug and antibiotics. In order to better treat this infection scientists have taken an interest in discovering more about *T. gondii*.

Dr. Striepen's lab is attempting to gain a better understanding of Striated Fiber Assemblins (SFAs), microtubule associated proteins, found in *T. gondii*. SFAs, and SFA-like proteins have already been characterized in several organisms including *Chlamydomonas reinhardtii*, and *Giardia lamblia*. In *Chlamydomonas*, SFA is thought to play a role in cell division based on fluorescent microscopy of the protein. Use of a green fluorescent protein (GFP) tag on the SFA gene to image *Chlamydomonas* revealed movement and conformational changes. During interphase the SFA produces a cross-like structure that eventually forms dots near the spindle poles when mitosis begins. Before the SFA reverts back to the cross-like structure, the SFA takes the shape of a line during telophase [2]. Furthermore, beta-giardin, an SFA homolog, is thought to play a role in nuclear division of *Giardia lamblia* based on its presence within the adhesive disk of the parasite [3]. The predicted roles of SFAs in other organisms support the hypothesis that SFA plays a role in the division process of *T. gondii*.



In order to characterize SFAs in *T. gondii*, Dr. Striepen's lab has made expression vectors for the three SFA genes (SFA2, SFA3, and SFA4) present in the tachyzoite stage of the parasite. The expression vectors, however, use very strong tubulin promoters that can cause over expression artifacts when imaging parasites. My research project that began in the fall of 2009 entails cloning expression vectors that use the endogenous promoters of the respective SFA genes. Over the summer, I hope to collect qualitative data by visualizing parasites that have been transfected with the native promoter expression vectors. Time-lapse imaging with an epifluorescent microscope will play a critical role in determining the actual structure of the SFA proteins during various stages of the cell cycle. In addition, I will also be doing co-immunoprecipitation experiments to determine what other proteins interact with the different SFA proteins. By compiling the qualitative data from microscopy and the results of my co-immunoprecipitation experiments, I will be able to understand the role SFAs play in *T. gondii*'s divisionary mechanism.

Faculty Research Mentor: Dr. Boris Striepen, Department of Cellular Biology

Oil Palm Proliferation in Peru

Rachel Perez



I propose to investigate the detrimental environmental, social, and economic effects of palm oil cultivation in Peru. I will conduct this research for eight weeks in Loreto, Peru in cooperation with members of the Peruvian Society for Environmental Law (*la Sociedad Peruana de Derecho Ambiental*, SPDA). SPDA provides the Peruvian government with valuable information about the effects of oil palm production on the people and landscapes of Peru. SPDA plans to propose and implement guidelines to minimize the harmful social and ecological effects of these plantations and to raise awareness about this serious issue on a local, national, and global level.

To combat oil shortages and carbon emissions, the Peruvian government passed a law requiring a 5% blend of biodiesel with all standard diesels by 2011. Many investors have subsequently turned to biofuel production as a quick source of income. One of the more

lucrative biofuel crops is the oil palm (*Elaeis guineensis*); palm oil is also a highly sought commodity on a global level for its versatility in other industries (food, beauty, and health products, and the metal and textile industries).

Large-scale oil palm plantations require vast tracts of land, which leads to extensive deforestation of rainforests with high conservation value. More companies are encroaching on protected forests and national parks, and the burning associated with creation of new oil palm plantations creates smog, carbon emissions, fires spreading to neighbor forests, and greater risk of future fires.

Besides threatening the habitats of many endangered, threatened, and protected species, deforestation also affects indigenous groups in Peru, who in many cases were guaranteed ancestral land rights and rely on forest products for their own sustenance as well as for commerce. Non-indigenous Peruvians are also affected by oil palm production because the monopoly of many agricultural plots by plantations results in less high-quality land available for food crops, which leads to a cycle of decreased supply of food and higher food prices.

The CURO Summer Fellowship will allow me to travel to Loreto, Peru, and work directly with SPDA for eight weeks. At SPDA, I will continue my research on this issue by studying a model oil palm farm set up in Loreto by the UN, translating oil palm-related documents from Spanish into English and from English into Spanish for wider distribution, interviewing local people and government officials about oil palm production, following the upcoming Peruvian local elections (which will affect oil palm production in the area), helping SPDA create more reports on this issue, and collecting references on Malaysian oil palm companies' expansion into Peru.

I have been conducting research on oil palm proliferation in Peru, Indonesia, and Malaysia in collaboration with CICR and SPDA since August 2009. I have also been corresponding via email and telephone with SPDA members Juan Luis Dammert, Pablo Peña, and Bruno Monteferrri, and they have helped me to develop my research plan. At CICR, I have created a database of references pertaining to oil palm and have written outlines that will serve as the framework for my research in Peru. I am now taking an upper level Spanish course (SPAN 4010- Advanced Conversation and Composition) and reading articles in Spanish sent to me from SPDA.

Degradation caused by the oil palm industry is a very real and very urgent issue. My research will help relevant actors make informed decisions about oil palm production in Peru. My research will also help to strengthen the institutional ties between CICR and SPDA, leading to further research collaborations in the future.

Research Faculty Mentor: Dr. Peter Brosium, Department of Anthropology

Foundations of Medical Philosophy in Ancient Civilizations
Ryan Prior

In his book *Hot, Flat, and Crowded*, Thomas Friedman discusses how in traditional South African societies, those with chronic illness who sought treatment from healers were not instructed to take elixirs or remedies, but were instead instructed to cook a meal for the entire village. The idea was that patients could help themselves by helping others. These societies realized that chronic illnesses were often the result of problems of the heart, and successfully managed them in ways that might confuse the traditional Western medical establishment.



As American politicians debate the merits of a new healthcare system, and as the world embraces a newly globalized order, many are realizing that the health problems that plague us worst and cost insurance providers the most money are chronic illnesses, illnesses that Western medicine has a spotty track record at treating. Many of the common sense, non-partisan health reform measures (like preventative care and fewer costly invasive procedures) that President Barack Obama has encouraged legislators to consider have their root most recently in innovations the Mayo Clinic and other cutting-edge hospitals have introduced. But these innovations have been introduced to America from much older healing traditions, traditions we would be wise to consider as we progress into the increasingly technology-oriented world of the 21st Century.

Most people today think of medicine in terms of pills, surgery, and needles, but a survey of various civilizations' health traditions reveals highly sophisticated and surprisingly accurate ideas about how the human body works and how it can be treated that range from yogic meditation to herbal tea remedies. Like Western medicine, Chinese Traditional Medicine and Indian Ayurvedic medicine have developed over thousands of years, however practitioners of these systems glean their insights not so much with CAT scans and T-cell counts as they do by examining the color and shape of a patient's tongue.

The Western medical tradition has its roots in the materialistic scientific rationalism that Greeks like Hippocrates espoused and scientists like Leonardo da Vinci re-discovered in the Renaissance. Likewise, Chinese medicine today is a direct descendent from Lao-Tzu, the chief shaper of Taoism, and the impression of yin-yang balance of the "chi" energy flow provides the major foundation for Chinese anatomical thought. Likewise, Ayurvedic medicine finds its foundations in the Bhagavad Gita.

The goal of this project will be to explore how the major medical systems of the world derive their guiding beliefs from the major philosophical, literary, and spiritual works that permeate a given culture. This anthropological eye that seeks to examine the idea of health from a psychological, physiological, and philosophical approach to the arts and sciences may seem a bit unfocused. But many civilizations don't draw artificial lines between disciplines as Western academia does, instead uniting their ideas in holistic systems of thought. Thus this project will utilize the full extent of the "liberal arts," from history and literature to sociology and religion, to help us gain a fuller understanding of what public health has meant across the world and through the centuries, and more importantly, what public health will look like in the globalized world.

Research Faculty Mentor: Dr. Katarzyna Jerzak, Department of Comparative Literature

The Effect Of Parasite Infection on Monarch Butterfly Mating Behavior
CURO-UGA Alumni Association Summer Fellow: Malavika Rajeev



Monarch butterflies (*Danaus plexippus*), a species best known for migrating between the eastern U.S. and Mexico annually, are commonly infected by a debilitating protozoan *Ophryocystis elektroscirra*. This study will examine the effect of parasite infection on mate choice and mating success in the monarch butterfly. Monarchs have a unique mating behavior (called ‘forced copulation’) whereby males chase and force themselves onto passing females. Although female monarchs do not actively choose their mating partners, females can struggle to avoid mating with certain males, and males may give up faster on certain females. Because infected monarchs are often in poorer condition than healthy butterflies, and because mating with an infected partner poses the risk of spore transmission to offspring, it is expected that infected male and female monarchs will mate less often than healthy butterflies. This study will be initiated using both healthy and experimentally infected monarchs raised under standard laboratory conditions. I will examine the number and duration of mating contests for healthy vs. infected males and females. I predict that healthy males will initiate more mating attempts, but that contest duration will be longer for infected males due to female avoidance behaviors. I also predict that healthy males will initiate more mating attempts with healthy (as opposed to infected) females, whereas infected males may be less choosy in selecting mating partners. A behavioral study of this nature has not yet been done with the monarch butterfly and could provide insight into the broader role of parasite infection on mating behavior.

Faculty Research Mentor: Dr. Sonia Altizer, Odum School of Ecology

Real-World Applications of Tolkien's Races and Cultures
Hope Rogers

J.R.R. Tolkien is best known as the author of the popular fantasy novels *The Hobbit* and *The Lord of the Rings*. However, he also wrote an elaborate history for his created world, along with many other short stories and essays, many of which are published in *The Silmarillion* and the twelve-volume *History of Middle-Earth*. In these writings, he creates a world rich with diversity, peopled with various races, from Men and Hobbits to Elves and Ents. These races are further subdivided into ethnicities and cultures, often differing as much as the races themselves. Far from being simple stereotypes, each is replete with its own language or dialect, history, cultural practices, and ethnic or racial interests, together rivaling the modern world in its ethnic diversity.



Although much criticism has discussed race and culture in Tolkien's works, almost all of it has failed to recognize that Tolkien's races play different roles in his philosophy. Much critical analysis deals with Tolkien's races narrowly, for example interpreting his works strictly in theological terms. Other analysis, in trying to apply all aspects of Tolkien's ethnic perspective to the real world, has suggested that Tolkien's work includes latent elements of racism. Such accusations are especially prevalent in discussions of the Orcs, an irredeemably evil race, which is presented as darker-skinned than the other races. In fact, Tolkien's races variously have theological, ideological, medieval or

mythic, and socio-cultural roots, and discussions that attempt to apply only one perspective to all of Tolkien's races misses many of their subtleties. For example, the much-criticized Orcs can be seen in theological terms as a relatively pure representation of evil and not as an allegory of a particular real-world race, and thus any superficial comparison between them and real-world races leads inappropriately to conclusions of racism. This research will examine when Tolkien's conceptions of race and culture can be applied fruitfully to the real world based on modern ideas about race and when they cannot, and on this basis will seek a more accurate understanding about what he is saying about race, issues surrounding it, and possible solutions relevant to our own world.

No comprehensive study of these applications has yet been undertaken. Throughout Tolkien's works, his races and cultures are shown interacting and working together to face the challenges and evils of their times, while simultaneously dealing with conflicts stemming from colonization, expansionism, assimilation, and cultural loss. Parallels to the real world, especially globalization after the World Wars, are clear, and Tolkien provides valuable insights into contemporary global issues. This includes possible solutions to racial conflicts through successful interracial relationships. For example, Legolas and Gimli, whose ethnic identities predispose them to be enemies, manage to form a genuine friendship within the Fellowship of the Ring. In fact, the Fellowship as a whole, which is made up of Men, Hobbits, an Elf, a Dwarf, and a Wizard, may be seen as an example of racial reconciliation and collaboration at multiple levels.

After establishing a background of modern critical ideas concerning race, culture, and ethnicity, this project will distinguish between the theological, mythic, and socio-cultural features of Tolkien's races. This will involve an exhaustive study of his complete *legendarium*, his letters and essays, and key critical pieces and will then identify insights into racial issues in the modern world.

Faculty Research Mentor: Dr. Jonathan Evans, Department of English

Human Resistance to Infection by African Trypanosomes
Carla Rutherford

African trypanosomes are parasitic protozoa found in sub-Saharan Africa that cause disease in both humans and large mammals. In humans, the subspecies *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense* cause African sleeping sickness, a neurological and fatal disease endemic to sub-Saharan Africa. In animals, *Trypanosoma brucei brucei* causes the wasting disease Nagana, which affects thousands of livestock each year. The difference in host specificity of these three subspecies of *T. brucei* is due to the activity of a minor subclass of human serum high-density lipoprotein called Trypanosome Lytic Factor (TLF), which is cytotoxic to *T. b. brucei* (Rifkin, 1978). The lytic activity is due to two specific lipoproteins assembled into the TLF particle, haptoglobin related protein (Hpr) and apolipoprotein L-I (apoL-I). Both Hpr and apoL-I have individual trypanolytic activity but kill most efficiently acting cooperatively within the TLF particle (Vanhamme et al., 2003; Shiflett et al., 2005).

The toxicity of human serum to *T.b. brucei* is well-documented; however, the molecular mechanism of killing is yet to be completely defined. The reported cellular morphology of human serum treated trypanosomes suggests two distinct phenotypes associated with cell death - swollen, "kite-shaped" cells and cells exhibiting a large cytoplasmic vacuole. In previous experiments, the morphological changes associated with serum killing were examined using both fixed cell imaging and time-lapse microscopy of live cells. Trypanosomes treated with freshly collected human serum were found to change rapidly in morphology from long, slender cells to swollen and "kite-shaped" prior to lysis at two hours. Treatment with low activity serum produced by prolonged storage at 4°C or heat inactivation for 30 minutes at 62°C, resulted in the gradual formation of a large cytoplasmic vacuole and a delay in trypanosome killing (approximately 16 hrs compared with 2 hrs with lytic serum). This large vacuole was also observed when cells were treated with highly purified, lipid free, apoL-I, one of the two lytic TLF proteins. The difference in lysis phenotypes support the hypothesis that the lytic mechanism is likely due to multiple TLF proteins and associated killing activities. One of these proteins may be selectively inactivated by heat treatment or prolonged storage resulting in the distinct morphologies observed.



The goal of my summer research will be to elucidate the distinct phenotypes of human serum killing and to identify the specific proteins involved with each distinctive phenotype. We will continue both fixed and live cell imaging of the cellular morphologies associated with each lytic TLF component, as well as, determine the specific activities through short-term and extended lysis assays. Analysis of the morphological phenotypes of killing of the individual protein components of TLF through these studies may lead to a better understanding of the mechanisms underlying trypanosome killing by human serum. Previous studies have reported that trafficking of TLF to the lysosome and acidification of the organelle is critical for lytic activity of the particle and the proposed mechanism of lysis (Shimamura, Hager, and Hajduk, 2001). The localization of the large vacuole has been reported to be lysosomal (Vanhollebeke et al, 2007), however, in our studies of cells treated with low activity serum we have observed a nonlysosomal localization of the vacuole. Further analysis using immunofluorescence microscopy, as well as, electron microscopy will be used to determine the localization of the cytoplasmic vacuole. Elucidating the mechanism of killing of *T.b.brucei* through these studies will enable us to better understand human innate immunity to these parasites, and, possibly, identify model mechanisms for potential drug therapies.

- Rifkin, M.R., 1978. Identification of the trypanocidal factor in normal human serum: High density lipoprotein. *Proc Natl Acad Sci USA.*, **75**: 3450-3454.
- Shiflett, A.M., Bishop, J.R., Pahwa, A., Hajduk, S.L. 2005. Human high density lipoproteins are platforms for the assembly of multi-component innate immune complexes. *J Biol Chem.*, **280**: 32578-32585.
- Shimamura, M., Hager, K.M., and Hajduk, S.L. 2001. The lysosomal targeting and intracellular metabolism of trypanosome lytic factor by *Trypanosoma brucei brucei*. *Mol. Biochem. Parasitol.*, **115**: 227-237.
- Vanhamme, L., Paturiaux-Hancoq, F., Poelvoorde, P., Nolan, D.P., Lins, L., Van Den Abbeele, J., Pays, A., Tebabi, P., Van Xong, H., Jacquet, A., Moguilevsky, N., Dieu, M., Kane, J.P., De Baetselier P., Basseur, R., and Pays, E. 2003. Apolipoprotein L-1 is the trypanosome lytic factor of human serum. *Nature*, **422**: 83-87.
- Vanhollebeke, B., Lecordier, L., Perez-Morga, D., Amiguet-Vercher, A., and Pays, E. 2007. Human serum lyses *Trypanosoma brucei* by triggering uncontrolled swelling of the parasite lysosome. *J. Eukaryot. Microbiol.*, **54**: 448-451.

Research Faculty Mentor: **Dr. Stephen Hajduk**, Biochemistry and Molecular Biology

Dialectical Behavior Therapy and distraction: Using the Cold Pressor Test to determine efficacy

Laura Smart

Borderline personality disorder (BPD), as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Ed. Text Revision (DSM-IV-TR; American Psychiatric Association, 2000), is described as “a pervasive pattern of instability of interpersonal relationships, self-image, and affects” (p. 706). In non-clinical samples it has a prevalence rate of 1-2% (Torgeson, Kringsen & Cramer, 2001). The proposed project would add to the literature on BPD’s most widely used treatment,

Dialectical Behavior Therapy (DBT). DBT utilizes four modules that directly address the symptoms of BPD. For instance, when under extreme stress, patients with BPD will dissociate, or become detached from reality, become paranoid, injure themselves or even attempt suicide. The distress tolerance module’s goal is to teach patients with BPD to tolerate and survive crises without resorting to these potentially harmful tactics and teaches him/her more effective coping mechanisms (Linehan, 1993). One such coping mechanism



taught by the distress tolerance module is distraction. The literature on distraction indicates that it is an effective strategy for tolerating distress (see Kuehner, Huggiziger, & Liebsch, 2009; Priem, & Solomon, 2009; Jain et. al., 2007). This study would test the efficacy of distraction by utilizing the Cold Pressor Test (CPT). The CPT has been used in a number of studies and is an empirically validated method for inducing stress in the laboratory (Lovallo, 1975). It involves submerging the participant’s non-dominant hand in 0-1° C water for three minutes in order to produce physiological arousal. The current study would use blood pressure and pulse readings in order to gauge the participant’s stress level after undergoing the Cold Pressor. Half of the participants would be randomly assigned to the experimental group which would be taught how to utilize distraction as a coping mechanism for the stress of the Cold Pressor. After the data is collected, it will be analyzed to determine if the participants who distracted themselves during the CPT show a significantly less change in physiological arousal from the baseline as compared with the control group. If the hypothesis is correct it will prove that the distress tolerance skill, distraction, is an effective method of preventing increases in blood pressure and heart rate. The study would be the first to examine the effects of distraction on these indicators of stress using the CPT and would have significant implications on the use of DBT as a therapy.

Research Faculty Mentor: Dr. Rheeda Walker-Obasi, Department of Psychology

Application of Friedel-Crafts Annulations to Conjugated Dienones and Silyl Substituted Arene Rings for the Synthesis of Complex Tricycles

Stephen Thompson

Silyl-substituted arenes promote *meta*-directed electrophilic aromatic substitution (cyclialkylation) by Lewis acid activation of conjugated dienones, forming tricyclic compounds composed of a central cycloheptane ring. The following is a three part synthetic scheme for the creation of the silyl-substituted tricycle: first, synthesis of the C-ring; second, synthesis of the A-ring followed by the coupling of the A and C-rings to create an arene-dienone; and third, the formation of the heptane B-ring to complete the target tricycle.



Scheme 1: C-ring Synthesis

Scheme 2: A-ring Synthesis, Coupling, and Dienone Formation

Scheme 3: Target Annulation

In organic synthesis, six-membered cyclic systems are easily and readily formed, while seven-membered carbon rings are more difficult to synthesize. Functionalization of the arene with activating groups will promote cyclialkylation, which is governed by the directing nature of the activating groups as well as the molecule's geometric restraints. The introduction of the silyl functionality on the arene would potentially allow a handle for further transformations, leading to more diverse tricycles.

Faculty Mentor: Dr. George Majetich, Department of Chemistry

A Study Of The Psycho-Physical Performance Technique Of Michael Chekhov
Jake Young



It is important to note that, even though humans have been engaging in performance of some kind ever since they inhabited this world, the “grammar” of performance is a relatively new concept. In the late 19th century Konstantin Stanislavski introduced the first techniques for actors to better approach the craft of performance. When an actor describes his “technique”, what does he mean? An actor’s technique is his method. It is the process he undergoes in order to physically and psychologically prepare himself to take the stage and to commit to believing in his actions while he is onstage. One of Stanislavski’s students, Michael Chekhov studied the work of his teacher, which was focused on an actor exploring the psychology and emotions of their characters leading them to action. But Chekhov also experimented directly with the actor’s physicality, using external qualities to lead to emotion. His theories of the connection between an actor’s physicality and his psychological impulses were considered so radical that before his studies could come to fruition he was exiled from his native Russia. Ironically, his works have only recently been published in his homeland, a country that is now relearning what he had explored in depth a century ago. The purpose of this research is two fold; 1) to have the opportunity to study with the few remaining students who actually studied under Chekhov, and become more familiar with his groundbreaking work, and 2) to bring to life the actual development of Michael Chekhov’s acting technique through the creation of a solo performance that will not only elaborate upon Chekhov’s life and the discovery of these techniques but present these findings in a performance that will make it accessible to the non-actor.

Faculty Research Mentor: Dr. George Contini, Department of Drama

Appendix A

CURO 2009 Summer Research Fellows

Christine Akoh, CURO-OVPR Summer Research Fellow

Dr. Joseph Frank, Department of Foods and Nutrition

Effect of Mono and Divalent Cations on Biofilm Formation in a Prolific Biofilm Forming Strain of Listeria Monocytogenes Cultured in a Chemically Defined Medium

Sambita Basu, CURO-Jane and Bill Young Scholarship Summer Fellow

Dr. Gerardo Alvarez-Manilla, Department of Biochemistry and Molecular Biology, Complex Carbohydrate Research Center

Protein-linked Glycoconjugates as Biomarkers for Cancer or Other Physiological Processes

Chip Blackburn, CURO-OVPI Summer Fellow

Dr. Hugh Ruppensburg, Department of English

Harry Crews and the Tradition of Southern Fiction-Writing

Corbin Busby, CURO Research Fellow

Dr. Isabelle Loring Wallace, Lamar Dodd School of Art

Imaging masculinity in Contemporary Fashion Photography

Kelly Cummings, CURO-OVPR Summer Fellow

Dr. Scott Schatzberg, Department of Veterinary Medicine

Differentiation of Natural and Post-vaccinal Canine Distemper Virus Encephalomyelitis

Charles Ginn, CURO Research Fellow

Dr. Hugh Ruppensburg, Department of English

Charting the Oppression of Minority Groups through Southern Gothic Literature

Erin Hansen, CURO Research Fellow

Dr. Jennifer McDowell, Department of Psychology

Effects of Daily Saccade Practice on Behavioral and Neural Plasticity in Schizophrenics

Dillon Horne, CURO-OVPI Summer Fellow

Dr. Thomas Cerbu, Department of Comparative Literature

The Development and Implications of Predictive Modes of Thought from the Renaissance to Modernity

Tiffany Hu, CURO Research Fellow

Dr. Stephen Hajduk, Department of Biochemistry and Molecular Biology

*Re-examine Alternative Editing and Understanding the Protein Diversity in *T. brucei**

Whitney Ingram, CURO-OVPI Summer Fellow

Dr. Yiping Zhao, Department of Physics

Optimization and Analysis of Titanium Dioxide Nanorod Photodegradation

Daniel Jordan, CURO Research Fellow

Dr. Betty Jean Craige, Department of Comparative Literature

German Sustainable Farming as a Model for Resource Stewardship

Fahad Khan, CURO-ITP Summer Fellow

Dr. Jason Zastre, Department of Pharmacy

Highly Active Antiretroviral Therapy

☞ Former CURO Summer Research Fellows ☞

Max Klein, CURO-UGA Alumni Association Summer Fellow

Dr. Richard Steet, Department of Biochemistry and Molecular Biology

Gauging the Developmental Impact of Impaired Glycoprotein Breakdown in Zebrafish

Susan Klodnicki, CURO-OVPR Summer Fellow

Dr. Jim Lauderdale, Department of Cellular Biology

Dr. Andrew Sornborger, Department of Mathematics and Engineering

PTZ and Other Chemoconvulsant Effects on Adult Zebrafish

Bridget Mailey, CURO Research Fellow

Dr. Amy Ross, Department of Geography

The ICC and the US: How have the Actions of the US Affected the ICC in the Past and how will they Affect the ICC in the Future?

Francisco Marrero, CURO Research Fellow

Dr. Leidong Mao, Department of Engineering

Development of Ferrofluid Based Platform for Particles and Cellular Manipulation

Amar Mirza, CURO Research Fellow

Dr. Natrajan Kannan, Department of Biochemistry and Molecular Biology

A Computational Study of the Crystalline Structure of Tyrosine Kinase Mutants

Cody Nichol, OVPR Research Fellow

Dr. Cynthia Suveg, Department of Psychology

Empirical Examination of Child Emotion Assessments: A Comparison of Child, Parent and Behavioral Observation Methods

Emily Pierce, CURO Summer Fellow

Dr. Wayne Parrot, Department of Crop and Soil Sciences

Genetic Alteration of the Soybean to Promote Astaxanthin Production

Akanksha Rajeurs, CURO Research Fellow

Dr. Russell Karls, Department of Veterinary Medicine

Develop an Efficient Method to Create Marked and Unmarked Mutations in the Human Genome

Al Ray, III, OVPI Research Fellow

Dr. Susan Sanchez, Department of Small Animal Veterinary Medicine

Relationship between Epidemiology of Salmonella in Non-Domestic Avian Species and Humans in the Southeastern United States

Joe Reynolds, CURO Research Fellow

Dr. Frank Harrison, Department of Philosophy

Analysis of the Nature of the Individual and the Notion of his Happiness

Matthew Sellers, CURO Research Fellow

Dr. Hugh Ruppensburg, Department of English

Finding God in the Poetry of Robert Penn Warren

Michael Slade, CURO Research Fellow

Dr. Frank Harrison, Department of Philosophy

Implicit System of Rational Thought Analogous to Modern First-Order and Modal Logics in Plato's Late Dialogues

∞ *Former CURO Summer Research Fellows* ∞

Alex Walker, OVPR Research Fellow

Dr. Timothy Dore, Department of Chemistry

Synthesis of BHQ-dithiol as a Photoremovable Protecting Group for Mifepristone

Shuyan Wei

Dr. Scott Schatzberg, Department of Veterinary Medicine

Development of Consensus-Degenerate Hybrid Oligonucleotide Primers (CODEHOPs) for Retroviral Discovery

2009 Howard Hughes Medical Institute EXORP Student

Valeriya Spektor

Dr. Sue Wessler, Department of Plant Biology

Designing Teaching Modules for Genome Analysis

Appendix B

CURO 2008 Summer Research Fellows

Zachary Anderson, CURO Summer Research Fellow

Dr. Peter Brosius, Department of Anthropology
Multicultural Perspectives on Landscape Change

Matthew Belcher, CURO-BHSI Summer Research Fellow

Dr. Michael Terns, Department of Biochemistry and Molecular Biology
Dr. Rebecca Terns, Department of Biochemistry and Molecular Biology
Determinants in the Localization of Telomerase to Telomeres

Mary Elizabeth Blume, CURO-OVPR Summer Research Fellow

Dr. Stefaan Van Liefvering, Department of Art History
Uncovering Traditions of the Gothic Style in the Architectural Plans of Saint Germain-des-Pres and Saint Martin-des-Champ in Paris

Milissa Brody, CURO-OVPR Summer Research Fellow

Dr. Ron Carroll, Odum School of Ecology
*Interactions of Bees and Hummingbirds with *Hamelia patens**

Carolyn Crist, CURO-UGA Summer Research Fellow

Dr. John Greenman, Journalism
News in the Black Belt: Teaching Journalists how to Cover Poverty in Persistently Poor Counties

M. Logan Davis, CURO-BHSI Summer Fellow

Dr. James Franklin, Department of Pharmaceutical and Biomedical Sciences
Long-Range Retrograde Transduction of Trophic and Survival Signals in Mouse Sympathetic Neurons

Marcus Hines, CURO-BHSI Summer Research Fellow

Dr. Michael Tiemeyer, Complex Carbohydrate Research Center
Dr. Lance Wells, Complex Carbohydrate Research Center
*Analyzing the Function of O-GlcNAc in *Drosophila**

Haylee Humes, CURO Summer Research Fellow

Dr. Marcus Fechheimer, Department of Cellular Biology
How AICD and Fe65 are Recruited to Hirano Bodies

Lindsay Jones, CURO Summer Research Fellow

Dr. Michael Terns, Department of Biochemistry and Molecular Biology
Dr. Rebecca Terns, Department of Biochemistry and Molecular Biology
Identification and Characterization of a Nuclease that Functions in an RNA-Mediated Viral Defense Pathway (RNAi) in Prokaryotes

Tyler Kelly, CURO Summer Research Fellow

Dr. Elham Izadi, Department of Mathematics
Usage of Linear Subspaces with Varieties

Jung Woong Kim, CURO Summer Research Fellow

Dr. Andrew Sorenborger, Department of Mathematics, Engineering
Dr. James Lauderdale, Department of Cellular Biology
Imaging of Endogenous Ca²⁺ Waves in Developing Zebrafish

Jennifer Lee, CURO-BHSI Summer Research Fellow

☞ Former CURO Summer Research Fellows ☞

Dr. Ronald Blount, Department of Psychology
Understanding Pediatric Symptoms

Sharon McCoy CURO-OVPR Summer Research Fellow
Dr. Chad Howe, Department of Romance Languages
Dialect Perceptions of Spanish Speakers in Georgia

Katherine McGlamry, CURO-Jane and Bill Young Scholarship Summer Research Fellow
Dr. Michael Tiemeyer, Complex Carbohydrate Research Center
Glycan Interactions and the Development and Spread of Cancer Cells

Alice Meagher, CURO-BHSI Summer Research Fellow
Dr. Michael Adams, Department of Biochemistry and Molecular Biology
Expression and Characterization of the Heterologously Expressed Soluble Hydrogenase I from Pyrococcus furiosus

Madison Moore, CURO-BHSI Summer Research Fellow
Dr. Jennifer McDowell, Department of Psychology
Behavioral and Neural Plasticity Following Daily Practice of Saccade Tasks in Schizophrenia

Emily Meyers, CURO-OVPR Summer Research Fellow
Dr. Patricia Sullivan, Department of International Affairs
The Advantage of Weakness: How Weak States can Overcome Military Might of Strong States

Kelly Nielsen, CURO-OVPR Summer Research Fellow
Prof. George Contini, Department of Theatre and Film Studies
Augusto Boal's Invisible Theatre: Political Play with an Unassuming Audience

Sean O'Rourke, CURO Summer Research Fellow
Dr. Kathy Simpson, Department of Kinesiology
Neuromuscular Activation and Movement Kinematics Exhibited During the Sit-to-Stand by Multiple Sclerosis Individuals

Julie Patel, CURO Summer Research Fellow
Dr. Patricia Sullivan, Department of International Affairs
Military Interventions by Powerful States

Neil Pfister, CURO-BHSI Summer Research Fellow
Dr. Michael Terns, Department of Biochemistry and Molecular Biology
Dr. Rebecca Terns, Department of Biochemistry and Molecular Biology
Interactions that Define the Organization of RNA-Protein Complexes Involved in Prokaryotic RNA Interference

Stefann Plishka, CURO-Franklin College of Arts and Sciences Summer Research Fellow
Dr. Asen Kirin, Department of Art History
Imagining Constantinople: Imperial Houses of Worship as Symbols of State Ideology

Katie Pyne, CURO Summer Research Fellow
Dr. Jerome Legge, Department of International Affairs
Refugees and Internally Displaced People: How Effective are the United Nations, Nongovernmental Organizations, and Subsequent Initiatives in Pacifying this Complex Humanitarian Crisis?

Joseph Rimando, CURO-Interdisciplinary Toxicology Program Summer Research Fellow
Dr. Ralph Tripp, Department of Infectious Diseases
Understanding and Preventing the Interaction between RSV's G Protein and the CX3CR1 Cell Receptor

☞ *Former CURO Summer Research Fellows* ☞

Aalok Sanjanwala, CURO Summer Research Fellow

Dr. Marcus Fechheimer, Department of Cellular Biology

Dr. Ruth Furukawa, Department of Cellular Biology

The Effect of Hirano Bodies on Mutated Tau Protein

Neeraj Sriram, CURO Summer Research Fellow

Dr. Mark Eiteman, Department of Biological and Agricultural Engineering

Solving the World's Energy Crisis – Not One Sugar at a Time

Giridhar Subramanian, CURO Summer Research Fellow

Dr. Brock Tessman, Department of International Affairs

Power and Influence in Southeast Asia: A Study of the Methods Used by India, China, and the United States

Aileen Thomas, CURO Summer Research Fellow

Dr. Nicole Lazar, Department of Statistics

How Random is Pseudorandom

Kathryn Turner, CURO Summer Research Fellow

Dr. Shelley Hooks, Department of Pharmaceutical and Biomedical Sciences

Comparison of RGS Regulation of LPA Signaling in Prostate Cancer and Ovarian Cancer

Manouela Valtcheva, CURO Summer Research Fellow

Dr. Jennifer McDowell, Department of Psychology

Antisaccade Performance and Deficit Characteristics in a Normal Population

Hunter Wilson, CURO Summer Research Fellow

Dr. Timothy Dore, Department of Chemistry

8-Chloro-7-hydroxyquinoline as a Biologically Useful Photoremovable Protecting Group

Laura Wynn, CURO-OVPR Summer Research Fellow

Dr. Martin Kagel, Department of Germanic and Slavic Languages

Issues in Current Turkish-German Literature

Appendix C

CURO 2007 Summer Research Fellows

Caroline M. Anderson, CURO-OVPR Summer Research Fellow

Dr. John Turci-Escobar, Department of Music Theory

Dr. Max Reinhart, Department of German

A Psychoanalytical Examination of Wolf and Mörike's Peregrina Songs

Joseph Burch, CURO Summer Research Fellow

Dr. Harry Dailey, Department of Microbiology and Biochemistry & Molecular Biology

Converting Ferrochelatase into a Cytochrome c Like Protein

Amy Burrell, CURO-BHSI Summer Research Fellow

Dr. Debra Mohnen, Department of Biochemistry & Molecular Biology

Analysis of the Transcriptional Expression of Arabidopsis GAUT Genes: 15 Proven and Putative Plant Cell Wall Biosynthetic Galacturonosyltransferases

Lee Ellen Carter, CURO-OVPR Summer Research Fellow

Dr. Fausto Sarmiento, Department of Geography

Ecoregional Conservation Among Indigenous Communities in Cotacachi, Ecuador

Kimberly DeLisi, CURO-BHSI Summer Research Fellow

Dr. Ray Kaplan, Department of Infectious Diseases

Parameters Affecting Fecal Egg Count Data for Determining Drug Resistance in Nematode Parasites of Horses

Joshua Dunn, CURO-OVPR Summer Research Fellow

Dr. William Kretzschmar, Departments of Linguistics and English

The Youth of Roswell Voices: A Linguistic Analysis

Katie Flake, CURO-BHSI Summer Research Fellow

Dr. Maor Bar-Peled, Complex Carbohydrate Research Center

The Arabinose Kinase Project

James Gordy, CURO Summer Research Fellow

Dr. Michael Adams, Department of Biochemistry & Molecular Biology

Developing Methodologies for the Study of Small ORFs in P. furiosus

Jana Hanchett, CURO Summer Research Fellow

Dr. David Schiller, Department of Musicology/Ethnomusicology

Latino and Hispanic Musical Influences on Athens-Clarke County

Laura Harrison, CURO-BHSI Summer Research Fellow

Dr. Corrie Brown, Department of Pathology

Campylobacter in the Crypts

Clare Hatfield, CURO-OVPR Summer Research Fellow

Dr. Stephen Shellman, Department of International Affairs

Democracy and the Choice of Law: The Intersections of Shari'a, Domestic and International Law

Anna Hudson, CURO Summer Research Fellow

Dr. Richard Dluhy, Department of Chemistry

Using Surface Enhanced Raman Spectroscopy for the Detection of Pathogens

☞ Former CURO Summer Research Fellows ☞

Andy Kragor, CURO-Jane & Bill Young Scholarship Summer Research Fellow

Dr. Lance Wells, Complex Carbohydrate Research Center

Dr. Carl Bergmann, Complex Carbohydrate Research Center

Unbiased Isolation and Carbohydrate Mapping of Alpha-Dystroglycan

Brian Laughlin, CURO-BHSI Summer Research Fellow

Dr. Alan Darvill, Complex Carbohydrate Research Center

Functional Analysis of the Magnaporthe grisea Secretome

James MacNamara, CURO Summer Research Fellow

Dr. Timothy Dore, Department of Biochemistry & Molecular Biology

Synthesis of Quinolinol-Based Inhibitors of Rce1p

Prashant Monian, CURO-Interdisciplinary Toxicology Program Summer Research Fellow

Dr. Brian Cummings, Pharmaceutical & Biomedical Sciences

Molecular Inhibition of Independent Phospholipase A2 and its Effect on Prostate Cancer Growth

Neil Naik, CURO-OVPR Summer Research Fellow

Dr. Ruth Harris, Department of Food & Nutrition

The Effect of Antagonizing Stress Receptors in Rats During Repeated Exposure to Restraint Stress

Natalie Nesmith, CURO-BHSI Summer Research Fellow

Dr. Mary Bedell, Department of Genetics

Genetic Studies on the Roles of KITL in Regulating the Proliferation and Apoptosis of Primordial Germ Cells in Mice

Victor Orellana, CURO Summer Research Fellow

Dr. Nicolás Lucero, Department of Romance Languages

Unsung Hero: A Literary and Historical Study of Lautaro

Tulsi Patel, CURO Summer Research Fellow

Dr. Scott Gold, Department of Plant Pathology

Developing a Biocontrol Agent for Chinese Privet, Ligustrum sinense

Tomas Pickering, CURO-OVPR Summer Research Fellow

Dr. Dorothy M. Fragaszy, Department of Psychology

Manner of Hammer Stone Use in Wild Capuchin Monkeys

Cleveland Piggott, CURO-BHSI Summer Research Fellow

Dr. Marcus Fechheimer, Department of Cellular Biology

The Formation of Hirano Bodies

Purvi Sheth, CURO Summer Research Fellow

Dr. Russell Karls, Department of Microbiology

Characterization of Mycobacterium shottsii

Traci Tucker, CURO Summer Research Fellow

Dr. Dawn Robinson, Department of Sociology

Gender and Role Meanings: A Cross-Cultural Comparison

Jessica Van Parys, CURO-UGA Alumni Association Summer Research Fellow

Dr. David Mustard, Department of Economics

Does Writing Ability Signal Academic Excellence?: Evidence from the New Scholastic Aptitude Writing Section (SATW)

∞ *Former CURO Summer Research Fellows* ∞

Delila Wilburn, CURO Summer Research Fellow

Dr. Barbara McCaskill, Departments of African American Studies and English

Beauty Imposed

Karen Wong, CURO Summer Research Fellow

Dr. Andrew Whitford, Department of Political Science

Appendix D

CURO 2006 Summer Research Fellows

Sarah Breevoort, CURO-BHSI Summer Research Fellow

Dr. Walter Schmidt, Department of Biochemistry and Molecular Biology

Construction of Three Rcelp Mutant Plasmids to Aid in the Characterization of Rcelp Enzymatic Activity

Lauren Coffey, CURO Summer Research Fellow

Dr. Stephen Shellman, Department of International Affairs

Susan Fang, CURO Summer Research Fellow

Prof. Christopher Hocking, Studio Foundations

Courtney Grant, CURO-BHSI Summer Research Fellow

Dr. Julie Coffield, Department of Physiology and Pharmacology

An Investigation of Botulinum Neurotoxin Interactions on RhoA Activity Using In Vitro Assays

Erica Hall, CURO-BHSI Summer Research Fellow

Dr. Jessie Kissinger, Department of Genetics

Adele Handy, CURO-UGA Alumni Association Summer Research Fellow

Dr. Greg Robinson, Department of Chemistry

Celan Hardman, CURO Summer Research Fellow

Prof. Joe Norman, Drawing and Painting

Sana Hashmi, CURO-Jane and Bill Young Scholarship Summer Research Fellow

Dr. Lance Wells, Complex Carbohydrate Research Center

Alteration of Alpha-Dystroglycan and Cancer Progression

Brian Levy, CURO Summer Research Fellow

Dr. Larry Nackerud, School of Social Work

Courrie – Not Email: Implications for Government Regulation of a Social Phenomenon. A Case Study of Language in France

Maggie Mills, CURO-NSF/SPIA Summer Research Fellow

Dr. Stephen Shellman, Department of International Affairs

Anna-Marieta Moise, CURO-BHSI Summer Research Fellow

Dr. Andrea Hohmann, Department of Psychology

Neurochemical Basis of Social Defeat in Syrian Hamsters: Role of Endogenous Cannabinoids

Lamar Moree, CURO-BHSI Summer Research Fellow

Dr. Alan Darvill, Complex Carbohydrate Research Center

Jesse Oakley, CURO Summer Research Fellow

Dr. Laurie Fowler, Department of Ecology

Economic Incentives for Private Land Conservation and Sustainable Development: Research into Environmental Policy in Costa Rica and Georgia

Katie Orlemanski, CURO-OVPR Summer Research Fellow

Dr. Patricia Richards, Department of Sociology

Reclaiming “Development” within the Context of Low-Income Neighborhoods

☞ *Former CURO Summer Research Fellows* ☞

Danielle Pearl, CURO-OVPR Summer Research Fellow
Dr. Keith Langston, Germanic and Slavic Languages
Press Freedom, E.U. Accession, and Democracy in Croatia

Daniel Perry, CURO Summer Research Fellow
Dr. David Landau, Department of Physics and Astronomy

Andrew Pierce, CURO Summer Research Fellow
Dr. Thomas McNulty, Department of Sociology

Richard Piercy, CURO-OVPR Summer Research Fellow
Dr. Cory Momany, Department of Pharmaceutical and Biomedical Sciences

Kurinji Pandiyan, CURO Summer Research Fellow
Dr. Steven Holloway, Department of Geography
Understanding Public Space in a New Urbanist Development

Mandy Redden, CURO-BHSI Summer Research Fellow
Dr. Robert Arnold, Department of Pharmaceutical and Biomedical Sciences
Towards a More Effective Delivery System for Anti-Cancer Drugs

Eva Bonney Reed, CURO-BHSI Summer Research Fellow
Dr. Ronald Blount, Department of Psychology

Lisa Rivard, CURO-Toxicology Summer Research Fellow
Dr. Jeff Fisher, Toxicology

Sonia Talathi, CURO-OVPR Summer Research Fellow
Dr. Brian Cummings, Department of Pharmaceutical and Biomedical Sciences
Effectiveness of Ca²⁺-Independent Phospholipase A2 Inhibitors in the Induction of Chemotherapeutic-Induced Cancer Cell Death

Erika Vinson, CURO Summer Research Fellow
Dr. Richard Siegesmund, Art Education

Joshua Watkins, CURO Summer Research Fellow
Dr. Patricia Sullivan, Department of International Affairs
The Price of Victory: When Leaders Underestimate the Cost of War

Daniel Weitz, CURO-OVPR Summer Research Fellow
Dr. Gary Bertsch, Department of International Affairs
The Impact of a European Union Nuclear Weapons Free Zone on the International Non-Proliferation Regime

Shannon Yu, CURO-BHSI Summer Research Fellow
Dr. Nancy Manley, Department of Genetics

Appendix E

CURO 2005 Summer Research Fellows

Grace Anglin, CURO-OVPR Summer Research Fellow

Dr. Kimberly Shipman, Department of Psychology
Family Focused Emotion Communication Training

Ashley Beebe, CURO Summer Research Fellow

Dr. James R. Holmes, Center for International Trade and Security
The Influence of Media on Economic Policy in Brazil and Argentina

Ingrid Bloom, CURO-BHSI Summer Research Fellow

Dr. Steven Stice, Department of Animal and Dairy Science
Differentiation of Human Embryonic Stem Cells into Endothelial Progenitors

Ian Lewis Campbell, CURO Summer Research Fellow

Dr. Glenn Wallis, Department of Religion
Theories of Mythology and the Way That Myths Have Affected Social and Political Formation

Kimberly Coveney, CURO-CIT Summer Research Fellow

Dr. Brian Cummings, Department of Pharmaceutical and Biomedical Sciences
Role of iPLA2 in Phospholipid Metabolism in Chemotherapeutic-Induced Cancer Cell Death

William Collier, CURO-OVPR Summer Research Fellow

Dr. Amy D. Rosemond, Institute of Ecology
*Analysis of an Exotic Species' Interactions with Native Aquatic Trophic Dynamics: Quantifying the Effects of the North American Beaver (*Castor canadensis*) on Sub-Antarctic Stream Food Webs in the Cape Horn Archipelago, Chile*

John Crowe, CURO Summer Research Fellow

Prof. Mark Callahan, Ideas for Creative Exploration
AUX Launch: Art, Representation, and Commerce on the Web

Katie Griffith, CURO Summer Research Fellow

Dr. Diana Ranson, Department of Romance Languages
Dr. Judith Preissle, College of Education
Assessing Cultural Values and Political Beliefs in a Nicaraguan Classroom: A Participant Observation

Matthew Haney, CURO-CTEGD Summer Research Fellow

Dr. Rick Tarleton, Department of Cellular Biology
*Antibody Depletion of Highly Abundant Proteins in *Trypanosoma cruzi* for the Fine-Tuning of Proteomic Analysis*

Ned Hembree, CURO Summer Research Fellow

Dr. Timothy Dore, Department of Chemistry
Rce1 and Ste24 Inhibition by Dipeptidyl Acyloxymethyl Ketones: A Potential Target for Cancer Therapeutics

Alicia Higginbotham, CURO Summer Research Fellow

Dr. Thomas Cerbu, Department of Comparative Literature
Christopher Logue's Iliad: A Work in Translation

Scott Jacques, CURO Summer Research Fellow

Dr. Mark Cooney, Department of Sociology
The Social Reality of Young, Middle Class Drug Dealers

☞ Former CURO Summer Research Fellows ☞

Lisa Jordan, CURO Summer Research Fellow

Dr. Ruth Harris, Department of Food and Nutrition

The Effect of Leptin on Sympathetic Nerve Activity in White Adipose Tissue

Carey Kirk, CURO-OVPR Summer Research Fellow

Dr. David Z. Saltz, Department of Theatre and Film Studies

The Effectiveness of Drama Techniques in Treating People Suffering from Trauma

Andrew Leidner, CURO-CTEGD Summer Research Fellow

Dr. Pejman Rohani, Institute of Ecology

Coevolutionary Behavior and Interference between Fatal Diseases

Jon McGough, CURO-BHSI Summer Research Fellow

Dr. Wyatt Anderson, Department of Genetics

*The Role of Female Choice in Sexual Selection of *Drosophila pseudoobscura**

Tatyana Nienow, CURO-BHSI Summer Research Fellow

Dr. Walter K. Schmidt, Department of Genetics

Adapting Yeast for the Study of Pitrilysin and Other M16A Enzymes

Erika Porter, CURO-BHSI Summer Research Fellow

Dr. Charles H. Keith, Department of Cellular Biology

Intrinsic Fluorimetric Imaging of Neural Activation in Cultured Cells and Zebrafish

Kurinji Pandiyan, CURO-CAES Summer Research Fellow

Dr. Raj Rao, Department of Animal and Dairy Science

Dr. Steven Stice, Department of Animal and Dairy Science

Genomic Instability of Human Embryonic Stem Cells

Kelly Proctor, CURO-OVPR Summer Research Fellow

Dr. Lee B. Becker, College of Journalism and Mass Communication

Differences in Environmental Reporting: China and the United States

Rebecca Trupe, CURO Summer Research Fellow

Dr. Kimberly Shipman, Department of Psychology

Family Focused Emotion Communication Training

Russ Richardson, CURO Summer Research Fellow

Dr. Ron Carroll, Institute of Ecology

Sugarcane Processing Waste as a Soil Amendment on Organic, Shade-Grown Coffee under Simulated Drought Conditions for Control of Plant-Parasitic Nematodes

Dustin Williams, CURO-BHSI Summer Research Fellow

Dr. Scott T. Dougan, Department of Cellular Biology

Development of Transgenic Zebrafish to Understand How Activation of Hyal-2 Leads to Tumor Formation

Fei Yang, CURO Summer Research Fellow

Dr. Janet Westpheling, Department of Genetics

*Regulation of Branched-Chain Amino Acid Catabolism in *Streptomyces coelicor*: Applications for Metabolic Engineering of Polyketide Antibiotic Biosynthesis*

Stephanie Yarnell, CURO Summer Research Fellow

Dr. Carl Bergmann, Complex Carbohydrate Research Center

Appendix F

CURO 2004 Summer Research Fellows

Cara Altimus, CURO Summer Research Fellow

Dr. Jonathan Arnold, Department of Genetics

*Isolation of a Light Receptor in the Biological Clock of *N. crassa**

Westin Amberge, CURO-BHSI Summer Research Fellow

Dr. Steven Stice, Department of Animal and Dairy Science

Guided Differentiation of Human Embryonic Stem Cells into Endothelial Cells: Focusing on the Ulex Europaeus Agglutinin I Lectin

Namrata Asuri, CURO Summer Research Fellow

Dr. Sidney Kushner, Department of Genetics

*Analysis of the Role of Ribosomal S1 in the Polyadenylation Pathway of *Escherichia coli**

Erin Bohan, CURO-OVPR Summer Research Fellow

Dr. Katarzyna Jerzak, Department of Comparative Literature

The Reconciliation of Selves: The Emigrant Experience in America

Rebecca Brantley, CURO-OVPR Summer Research Fellow

Ms. Ashley Callahan, Georgia Museum of Art

The Early Fashion Design of Mariska Karasz and the Influence of Her Native Hungary

Josef Broder, CURO Summer Research Fellow

Dr. Andrew Sornborger, Department of Mathematics

Techniques in High Noise Image Analysis

Beau Bryan, CURO-BHSI Summer Research Fellow

Dr. Michael Pierce, Department of Biochemistry and Molecular Biology

N-Cadherin G1

Susannah Chapman, CURO Summer Research Fellow

Dr. Virginia Nazarea, Department of Anthropology

Designing Sui Generis Systems for Traditional Plants and Associated Local Knowledge

Clayton Griffith, CURO-OVPR Summer Research Fellow

Dr. Amy Rosemond, Institute of Ecology

*The Effect of the North American Beaver (*Castor Canadensis*), an Exotic Herbivore, on the Composition, Structure, and Regeneration of the Riparian Vegetation of Sub-Antarctic Forested Streams in Chile*

Christopher Hale, CURO-BHSI Summer Research Fellow

Dr. Thomas F. Murray, Department of Physiology and Pharmacology

Adolescence as a Distinct Period of Vulnerability to Nicotine Addiction

Catherine Hudson, CURO-BHSI Summer Research Fellow

Dr. Harry Dailey, Department of Microbiology and Biochemistry and Microbiology

*Negatively Affecting the Heme Biosynthetic Pathway in "*Escherichia coli*"*

Douglas Jackson, CURO Summer Research Fellow

Dr. Nigel Adams, Department of Chemistry

Reactions of Protonated Carboxylic Acid Ions with Amines in the Interstellar Medium

☞ Former CURO Summer Research Fellows ☞

Andrew Leidner, CURO-BHSI Summer Research Fellow

Dr. Pejman Rohani, Institute of Ecology
Parasitoid Behavior and Evolutionary Dynamics

Janel Long, CURO-OVPR Summer Research Fellow

Dr. Jean Martin-Williams, School of Music
The Partitas of Franz Krommer and Natural Horn Technique

John McWhorter, CURO-BHSI Summer Research Fellow

Dr. Daniel Colley, Department of Microbiology
Induction of the Regulatory Ligand PD-L2 and the Co-regulatory Receptor PD-1 on CD4 Lymphocytes During Early Experimental Schistosomiasis Mansoni

William Parker, CURO Summer Research Fellow

Dr. Marly Eidsness, Department of Chemistry
Trigger Factor

Gehres Paschal, CURO-OVPR Summer Research Fellow

Dr. J. David Puett, Department of Biochemistry and Molecular Biology
Activating Mutations of the Lutropin/Choriogonadotropin Receptor Associated with Familial Precocious Puberty, Male Pseudohermaphroditism, Hypogonadism, Amenorrhea, Leydig cell Hyperplasia, and Metastatic Thyroid Carcinoma

Kevin Patrick, CURO Summer Research Fellow

Dr. James Anderson, Department of Classics
Cicero and the Foundations of a Legal Education at Rome

Katherine Price, CURO Summer Research Fellow

Dr. Janet Westpheling, Department of Genetics
Site Specific Chromosomal Integration Mediated by Bacteriophage Integrase

Matthew Rudy, CURO Summer Research Fellow

Dr. Marly Eidsness, Department of Chemistry
Analysis of Cotranslational Protein Folding in E-coli and Determination of the Role of the Trigger Factor Gene in the Folding Process

Desiree Smith, CURO Summer Research Fellow

Dr. Roberta Fernandez, Department of Romance Languages
Projecting a Positive Educational Experience for Latina/os in the South

Christopher Stokes, CURO-OVPR Summer Research Fellow

Dr. Randy Kamphaus, School of Professional Studies
Family Health and Classroom Behavior: A Pilot Study

Shana Strickland, CURO-BHSI Summer Research Fellow

Dr. Kimberly Shipman, Department of Psychology
Emotional Regulation and Coping Skills in Maltreated Children

Adam Stroupe, CURO Summer Research Fellow

Dr. Boris Striepen, Department of Cellular Biology
*Drug and Nutrient Trafficking in the Human Pathogen *Cryptosporidium parvum**

‡ Former CURO Summer Research Fellows ‡

Teerawit Supakorndej, CURO-BHSI Summer Research Fellow

Dr. Michael Terns, Department of Biochemistry and Molecular Biology

Identification of the Determinates for the Differential Subcellular Localization of Human Telomerase RNA in Normal vs. Cancer Cells

Tendoh Timoh, CURO Summer Research Fellow

Dr. Marly Eidsness, Department of Chemistry

Fluorophore-modified Nascent Polypeptides

Jora Vaso, CURO-OVPR Summer Research Fellow

Dr. Katarzyna Jerzak, Department of Comparative Literature

The Effect of Communism on the Works of Andric, Kadare, and Szymborska

Leslie Wolcott, CURO-OVPR Summer Research Fellow

Dr. Betty Jean Craige, Center for Humanities and Arts

The Environment in Georgia's Literature, Past and Present

Appendix G

CURO 2003 Summer Research Fellows

Anthony Anfuso, CURO Summer Research Fellow

Dr. Maor Bar-Peled, Department of Biochemistry and Molecular Biology
Developing a Fast Plant Expression System to Identify Biosynthetic Genes Involved in Pectin Synthesis

Tiffany Beal, CURO-BHSI Summer Research Fellow

Dr. Debra Mohnen, Department of Biochemistry and Molecular Biology
Determining How Pectins Inhibit Cancer Growth and Metastasis

Robert Brady, CURO Summer Research Fellow

Dr. Nader Amir, Department of Psychology
Malleability of Interpretation Bias in Social Anxiety and General Anxiety

Josef Broder, CURO Summer Research Fellow

Dr. Chi N. Thai, Department of Biological and Agricultural Engineering
Operational Characteristics of a Mobile Spectral Imaging System for Plant Health Detection

Martha Rose Calamaras, CURO Summer Research Fellow

Dr. Kim Shipman, Department of Psychology
Emotional Understanding in Abused and Neglectful African-American Families

Daniel del Portal, CURO-BHSI Summer Research Fellow

Dr. Marcus Fechheimer, Department of Cellular Biology
The Physiological Role of Hirano Bodies

Dustin Dyer, CURO Summer Research Fellow

Dr. Guigen Zang, Department of Biological and Agricultural Engineering
Dr. Michael Geller, Department of Physics and Astronomy
Energy Dissipation in Nanomechanical Resonators

Sarah Fritts, CURO Summer Research Fellow

Dr. John P. Carroll, School of Forest Resources
An Inventory and Assessment of Medicinal Plants and Animals Used by Makuleke Traditional Healers on the Northern Boundary of the Kruger National Park, South Africa

Betsy Goodwin, CURO-BHSI Summer Research Fellow

Dr. Ronald Blount, Department of Psychology
A Study of the Psychology of Pediatric Pain and Chronic Illness

Patrick Gosnell, CURO Summer Research Fellow

Prof. Ben Reynolds, Department of Photography
The Beautiful and the Absurd

Paulette Andrea Greene, CURO-BHSI Summer Research Fellow

Dr. Wyatt Anderson, Department of Genetics
*Conspecific Sperm Precedence and Speciation in *Drosophila pseudoobscura**

Andrea Haltiner, CURO-BHSI Summer Research Fellow

Dr. Ruth Harris, Department of Foods and Nutrition
The Effects of Leptin on Leptin Receptor Expression in High-Fat Fed Mice

☞ Former CURO Summer Research Fellows ☞

Luke Hoagland, CURO-BHSI Summer Research Fellow

Dr. Marcus Fechheimer, Department of Medical Cellular Biology

The Role of Myosin II in Hirano Body Development and the Impact of Hirano Bodies on Cell Viability

Christopher “Kit” Hughes, CURO Summer Research Fellow

Prof. Mark Callahan, School of Art

Tagging

Steven Jocoy, CURO Summer Research Fellow

Dr. Michael Bender, Department of Genetics

Leena Kukkarni, CURO Summer Research Fellow

Dr. Maor Bar-Peled, Department of Biochemistry and Molecular Biology

Identification Characterization of Enzymes and Gene Products Involved in the Synthesis of Pectic Polymers Using Mucilage as Acceptors

Valerie Marshall

Dr. Ben Blount, Department of Anthropology

Ashley Neary

Dr. Susan Sanchez, Department of Medical Microbiology and Parasitology

Sensitive and Specific Detection of Fungal Keratitis in Horses

Ngozi Ogbuehi, CURO Summer Research Fellow

Dr. Mary Alice Smith, Department of Environmental Health Science

Comparing Apoptosis During Different Stages of Limb Development in Chick Embryos

Melissa Payton, CURO Summer Research Fellow

Dr. Lillian Eby, Department of Psychology

Antecedents and Consequences of Networking Behavior for Individuals Seeking Reemployment

John Drew Prosser, CURO Summer Research Fellow

Dr. Wyatt Anderson, Department of Genetics

*Kin Recognition in *Drosophila paulistorum**

Ryan Rhome, CURO Summer Research Fellow

Dr. Jan Westpheling, Department of Genetics

*Analysis of *bkdR* Protein Function in *Streptomyces coelicolor* and *S. avermitilis**

Susan Ritger, CURO-BHSI Summer Research Fellow

Dr. Duncan C. Ferguson, Department of Physiology and Pharmacology

Immunoreactivity and Bioactivity of Recombinant Thyrotropins (TSH)

Ben Solomon, CURO Summer Research Fellow

Dr. Kevin McCully, Department of Exercise Science

Measuring Age Related Changes in Muscle Compliance Using Ultrasound

Mary Tolcher, CURO Summer Research Fellow

Dr. Tim Hoover, Department of Microbiology

*Identification of Developmentally Regulated Proteins in the Budding Bacterium *Hyphomonas neptunium**

Meghan Wilson, CURO-BHSI Summer Research Fellow

Dr. James Lauderdale, Department of Cellular Biology

Pax 6b

∞ *Former CURO Summer Research Fellows* ∞

Ryan Wilson, CURO Summer Research Fellow

Roger Moore, Department of Landscape Architecture

Thomas Wood, CURO Summer Research Fellow

Dr. Walter Schmidt, Department of Biochemistry and Molecular Biology

Analysis and Characterization of CAAX Proteases

Appendix H

CURO 2002 Summer Research Fellows

Nadia Behizadeh

Dr. Tricia Lootens, Department of English

Ashley D. Chadha

Dr. Michael McEachern, Department of Genetics
Characterization of stn-1 M1 mutant in K. lactis

Emily DeCrescenzo

Dr. Susan Sanchez, Department of Biochemistry and Molecular Biology
Development of a Detection Method for TSST-1 exotoxin from Staphylococcus aureus Associated with Toxic Shock Syndrome in Horses Directly from Clinical Samples

Ivy Forkner

Dr. Debra Mohnen, Department of Biochemistry and Molecular Biology
Functional Expression of Putative Biosynthetic Genes for Pectin: A Plant Polysaccharide with Anti-Cancer Activity

Cory S. Gresham

Dr. James B. Stanton, Department of Pathology
Dr. Corrie C. Brown, Department of Pathology
Development of a Reverse Transcriptase-Polymerase Chain Reaction Based Assay for the Detection and Differentiation of Dolphin Morbillivirus and Porpoise Morbillivirus

Nowell Hesse

Dr. Maor Bar-Peled, Department of Plant Biology
Identification of Nucleotide-Sugar Biosynthetic Genes Involved in Glycoconjugate Synthesis

Matt Hoffman

Dr. Will York, Department of Biochemistry and Molecular Biology
Comparative Structural Analysis of Xyloglucans from Plants in the Subclass Asteridea

Parker Hudson III

Dr. Mary Bedell, Department of Genetics

Britt Johnson

Dr. Janet Westpheling, Department of Genetics
The Use of Generalized Transduction for Combinatorial Biosynthesis of Novel Antibiotics

LeeAnn Jones

Dr. Massimo Palmarini, Department of Medical Microbiology
Mechanisms of JSRV-Induced Cell Transformation InVivo

Jenna Lee

Dr. Andrew Herod, Department of Geography
A Study of Sustainable Economic Development in Croatia

Judson A. Lewis

Dr. John F. McDonald, Department of Genetics
Evolutionary Contributions of Retrotransposon Elements in the Genome of D. melanogaster

☞ Former CURO Summer Research Fellows ☞

Cheryl L. Maier

Dr. Scott Pratt, Department of Animal and Dairy Science
Comparative Analysis of Nuclear Proteins Present in Donor Cells Used for the Nuclear Transfer Process and Cloning

Julie Orlemanski

Dr. Jed Rasula, Department of English
Sounding and Silencing: Suspended States in the Works of Thomas Pynchon

Gautham Pandiyan

Dr. Jacek Gaertig, Department of Cellular Biology
Study of Cilial Growth Suppression Mechanism in Tetrahymena Thermophila

Joanne Shinpoch

Dr. Daniel Dervartanian, Department of Biological Sciences
Purification and Characterization of Nickel Protein(s) from Bovine Heart and Their Relationship to Heart Disease

John Stark

Dr. Scott Atkinson, Department of Economics
Dr. Michael Rauscher, Department of International Economics, Rostock University
An Economic Labor Supply Analysis of Poland's Planned Entry into the European Union with Regard to the German Economy

Joshua Striker

Dr. Thomas Cerbu, Department of Comparative Literature
The Human Experience of Time: Literary and Philosophical Accounts/Representations

Nwakaso Umejiego

Dr. Boris Striepen, Department of Cellular Biology
IMPDH as a Potential Target of Drugs to Treat Cryptosporidiosis

Ben Walters

Dr. Elizabeth Brient, Department of Philosophy
The Aestheticization of Text

Lauren Watson

Dr. Jeffery Berejikian, Department of Political Science

Katherine Williams

Dr. Kojo Mensa-Wilmot, Department of Cellular Biology
Dr. Anne Clark, Oxford University

Brad Wright

Dr. Larry Nackerud, School of Social Work
A Comparative Healthcare Policy Analysis of the United States and Sweden

Appendix I

CURO 2001 Summer Research Fellows

Siobahn Beaton

Dr. Debra Mohnen, Complex Carbohydrate Research Center
Progress toward the Partial Purification of a Pectin Biosynthetic Gene

David Cureton

Dr. Janet Westpheling, Department of Genetics
Development of an In Vitro Packaging System for a Streptomyces Bacteriophage

Jon E. Davis

Dr. Gary Bertsch, Department of Political Science
Identifying the Risks of China's Nuclear Weapons Command-and-Control System in the Event of Political Crisis

Sayan De

Dr. Max Reinhart, Department of Germanic and Slavic Languages
The Progress and Modernization of Former East German Healthcare after Communism

Lawrence Dougherty

Dr. Daniel Promislow, Department of Genetics
Exploring Olfactory Response in Drosophila melanogaster and Evolutionary Theory of Aging

Matt Edwards

Dr. Gary Bertsch, Department of Political Science
Evaluating the Moscow Center for Export Control's Role as a Non-Proliferation Epistemic Community Member

Ben Emanuel

Dr. Frances Teague, Department of English
Shakespeare on Screen: Henry in Hollywood

Jeff Halley

Dr. Sheng Cheng Wu, Department of Biochemistry and Molecular Biology
Cell Wall-Degrading Enzymes from the Fungus That Causes the Devastating Rice Blast Disease

Peter Harri

Dr. Kojo Mensa-Wilcot, Department of Cellular Biology
Gene Expression in Leishmania: Control of Protein Synthesis in Leishmania 5' Untranslated Regions

Amanda Hudson

Dr. Michael Terns, Department of Biochemistry and Molecular Biology
Screening Mutant Yeast Strains for Abnormalities in the Localization of snoRNA

Kenneth Miller

Dr. Timothy Dore, Department of Chemistry
Synthesis and Use of Caged Compounds to Explore Cellular Processes

Lorina Naci

Professor William Paul, Jr., School of Art
Each morning I get up with one word in mind: plastik...

∞ Former CURO Summer Research Fellows ∞

Lynn Nguyen

Dr. Mark Wheeler, Department of Dance
Chinese Classical Dance

Cori Pelletier

Dr. Roy Grant, Department of Music Therapy
Music Therapy with Premature Infants

Kate Smith

Dr. Kenneth S. Latimer, Department of Pathology
Immunohistochemical (IHC) Detection of Natural Killer Cells in Fish

Buudoan V. Tran

Dr. Karl N. Kirschner, Complex Carbohydrate Research Center
Dr. Robert J. Woods, Complex Carbohydrate Research Center
Parameter Development and Application of the Glycam Force Field for Sialic Acid Derivatives

John Woodruff

Dr. Harry Dailey, Department of Microbiology
The Generation of Mutations in the n-Terminal Region of the Protoporphyrinogen Oxidase of Bacillus subtilis to Create a Protein Capable of Mitochondrial Targeting in Mammalian Cells