

SURE AWARDS MADE FOR SUMMER '08

Thirty-five Stonehill College students will work with twenty-one faculty members on a variety of research projects over the coming summer of 2008. The scholars and their faculty mentors are the thirteenth group to work under the Stonehill Undergraduate Research Experience (SURE) program, whose purpose is to provide students with an opportunity to perform significant, publishable research under the guidance of an experienced faculty researcher. The research experience will help to provide students with a competitive advantage in graduate and professional school applications and in post-college employment opportunities, as well as to provide assistance to faculty in research activities.

Lindsay Henry '09, Jessica Roberge '09, Laura Schulz '09 and Courtney Sullivan '09 will work with **George Branigan**, Associate Professor of Education, on *The Providence Reform School Project*. This project is a continuation of an ongoing three year investigation into the records of the Providence Reform School, 1850-1880. Henry, Roberge, Schulz, and Sullivan are Elementary Education majors, with second majors in Psychology. Together, they will finish transcribing the final Superintendent's Journal found at the Providence City Archives and will transfer the set of records to a searchable CD format that will be donated to the Rhode Island Historical Society for use by other scholars. The team will also continue to build and extend the data base which covers the lives of each of the 2725 inmates, reconstructing the life course trajectories of the inmates. This includes details such as living conditions, family dynamics, marital status and occupational track. In addition, the team members will continue transcribing and cataloguing their discovery of over 1,000 letters written to the Reform School from 1851 to 1880. The students will help contribute to Professor Branigan's book, *Beyond Control: A Children's History of the Providence Reform School* and present their findings through various publications and presentations at conferences around the nation.

Sarah Keeling '09 will work with **Maria Curtin**, Associate Professor of Chemistry, on *Investigation of Chlorine Dioxide Production During the Oxidation of Ascorbate by Chlorite*. Keeling, a Chemistry major, will focus her research on the technology described in recent patent applications for a Portable Chemical Sterilizer (PCS) and a liquid sprayer used to disinfect foods and food surfaces. This is now of great interest to the public in light of the recent MRSA scares. In addition, the PCS has been shown to sterilize medical instruments in fifteen to thirty minutes without electricity, which is very important for military hospitals and medical units, disaster relief agencies, and medical care in remote sites.

Amber Riendeau '09 will work with **Maria Curtin**, Associate Professor of Chemistry, on *Temperature Dependence of Al-27 NMR Spectra of Aqueous Aluminum Solutions*. Riendeau, a Chemistry major, will concentrate on the Nuclear Magnetic Resonance (NMR) of aqueous aluminum solutions, in particular the $\text{Al}(\text{H}_2\text{O})_6^{3+}$ species. One interesting NMR characteristic of the $\text{Al}(\text{H}_2\text{O})_6^{3+}$ NMR peak is that it becomes broader as the pH is increased. The project will investigate this phenomenon by looking at the temperature dependence of the NMR spectra of aluminum solutions at varying hydrogen ion concentrations. If the team is able to produce results and can form an explanation for the trend, they will present a poster at the National American Chemistry Society meeting.

Angela Farinella '10 will work with **Roger M. Denome**, Associate Professor and Chair of Biology, on *Analysis of Genetic Differentiation in Local Redback Salamander Populations*. Extinction rates for amphibians are extremely high compared to other groups of organisms. One likely explanation for this phenomenon is population fragmentation. The redback salamander is one of the most common vertebrates in eastern North America, but because of the rapid expansion of paved roads in the last century, their population has been carved into multiple small populations. This study will continue work performed by SURE students last year with the intent to determine if roads act as a barrier to gene flow among these populations. Farinella, a Biology major, will aid in the submission of a publication in a peer-reviewed journal. The results will be presented to the college community in an open forum and at the Eastern New England Biological conference in April 2009.

Sara Vicenzi '10 will work with **Richard B. Finnegan**, Professor of Political Science, on *The Evolution of Ireland's Membership in the European Union*. The project will help develop a chapter in Professor Finnegan's manuscript *Politics in Ireland since the 1960s*, to be published by the University of Notre Dame Press in 2009. The objective of this book is to chart the developments in major policy areas of Ireland since 1960. This research is focused on Ireland's overall participation in the European Union, specifically the 2001 Irish vote rejecting the Nice Treaty. Vicenzi, majoring in International Studies and Foreign Language, will examine Irish attitudes and political positions on developments in the EU, such as the rejection of the EU constitution in 2006, and the potential for another version of an EU constitution to be offered to the members in 2008. Her efforts on the projects will ultimately result in a paper to be presented at a conference such as the New England Political Science Association Convention.

Chris Tirrell '09 will work with **Susan Guarino-Ghezzi**, Professor of Sociology and Criminology on *Staff-Parenting Styles in Juvenile Corrections*, a continuation of their SURE project last summer, *Juvenile Justice Initiatives: Examining the Latest Trends*. The research involves understanding whether effective parenting styles, as indicated in developmental psychology, are employed by program staff in juvenile correctional facilities. Tirrell, a double major in Psychology and Sociology focusing on Youth and Family Services, will help conduct research, develop and administer questionnaires, and develop standards for staff job descriptions for the Massachusetts Department of Youth Services. He will also aid in revising the book, *Balancing Juvenile Justice*, co-authored by Professor Guarino-Ghezzi to be resubmitted for publication.

Gina Ciovacco '09 and **Evan Tallmadge '10** will work with **Marilena Hall**, Assistant Professor of Chemistry on *Characterization of the Zinc Binding of Phage-displayed Peptides and the Investigation of the Effect of Gene II Shine-Dalgarno Mutations*. Enzymes are the proteins that catalyze all the important reactions in biological systems. Understanding how an enzyme operates can provide useful information about how to best catalyze a given reaction and can be applied to the development of medicinal compounds as well as industrial catalysts. A good way to simulate a protein on a smaller scale is using a short chain of amino acids, called a peptide. The team will use a *peptide library* to identify a peptide that can bind to zinc as well as research the presence of phage displaying HAIYPRH that could have an effect on the outcome of panning experiments that employ the peptide library used by hundreds of researchers worldwide. Based on their findings, the students will add to a manuscript that has been accepted for publication by *Analytical Biochemistry*.

Priscilla Tanger '10 will work with **Magdalena James-Pederson**, Associate Professor in Chemistry and Biology, on *Molecular cloning and sequencing of enzyme genes from Armillaria involved in wood degradation*. This project represents an expansion of the ongoing research by Professors Robert and Diane Peabody on the honey mushroom *Armillaria gallica*. The main interest of the project is to learn more about the specific enzymes and genes from *A. gallica* that allow this fungus to degrade the root of the infested tree. In order to accomplish this objective, genomic DNA from *A. gallica* will be isolated and used to construct a genomic library. This library will then be screened in search of the genes that code for wood-rotting enzymes. The research will result in a poster presentation in the 2008 Eastern New England Biological conference.

Ashley Garland '09 and **Meaghan Stiman '10** will work with **Patricia Leavy**, Associate Professor and Chair of Sociology and Criminology, on *A Qualitative Study of Bodies*. The research is focused on the topic of body image and sexual identity and will have two major outcomes. Both Garland, a Psychology major, and Stiman, a Gender Studies and Sociology Major, will provide assistance on the detailed outline of a book manuscript to be submitted to Guilford Publications. The book will contain chapters on family, peers, media culture, romantic relationships/dating, food and exercise, and body image disturbance. In addition, the students will co-author an article that will focus on body image issues among homosexual and bisexual college-age men and women. It is also likely that the team will develop a conference presentation based on this work.

Laura Chechette '09 will work with **Ronald Leone**, Associate Professor of Communication, on *Violent Ratings Creep in PG-13 Films*. This project is a continuation of research initiated during the 2007 SURE program on "ratings creep." It refers to the commonly held belief that movie content more suitable for an adult audience is increasing in films with "lower" ratings, making this type of content more readily available to children. No rating is of greater significance than PG-13, because, among unrestricted rating categories (G, PG, PG-13), it is the one that allows for the highest degree of "adult" content. Previous research shows that there were significant gains in violent content from 1988 to 1997. The project will focus more specifically on when this escalation in violence took place and its correlation with similar patterns in other media.

Ashley Lajoie '09, **Natalie Dogal '10**, **Nicholas Pace '10** and **Sara Roderiques '10** will work with **Louis Liotta**, Professor of Chemistry, on *The Synthesis of Polyhydroxylated Pyrrolidines and Pyrrolizidines from Commercially Available Sugars*. Carbohydrates are the most widely distributed naturally occurring organic compounds on earth. Over the last several years, SURE scholars in collaboration with Dr. Liotta have developed a means of efficiently converting commercially available sugars into vinyl pyrrolidines. Roderiques, a Chemistry major, along with Lajoie, Dogal, and Pace, all Biochemistry majors, will further develop the synthesis to allow for the synthesis of polyhydroxylated pyrrolidines and pyrrolizidines. Results of the research will be presented at various chemistry conferences. The project will also include the preliminary preparation of a manuscript that will be submitted for publication once sufficient results have been obtained. Lajoie will participate in the project as a SURE Leader.

Anna Kern '10 will work with **Gregory Maniero**, Assistant Professor of Biology on *Influence of Temperature, Salinity, and Desiccation on Heat Shock Protein Expression in Bivalves and Gastropods from a Tidal New England River*. Organisms that inhabit tidal zones encounter a suite of challenges due to the rapid changes that they encounter in temperature, salinity, and availability of water. The study of heat shock responses of marine organisms may provide information on the ability of organisms to survive as the temperature of the planet's surface waters continue to rise and levels of tidal zones change with rising global temperature. The investigation will focus on the effect of stressful conditions found in intertidal zones on the heat shock response of several species of local mussels and snails. The research will result in publication in a suitable journal as well as a poster presentation at the Eastern New England Biological Conference.

Shannon Deirdre Rice '09 will work with **Monique Myers**, Assistant Professor of Communication, on *China's One Child Policy*. As a continuation of last year's SURE project, the research will focus on the apparent discrepancy between what Chinese and U.S. American citizens believe to be true about the ramifications of China's one child policy regarding human rights issues for women and girls in China. This team finds it imperative to learn more about how the discourse surrounding China's one child policy is framed and disseminated in public domains. While studying abroad in Beijing, China, Rice, an International Studies major, used her time there to gather initial research on the Chinese government's stance as well as the various reactions from the Chinese populace to the One Child Policy. The research will result in at least one conference presentation as well as a manuscript to be submitted to a scholarly journal for potential publication.

Tom Herson '09, Lindsay Prescott '09, Katy Fallavollita '10, and Sarah Wilson '10 will work with **Robert Peabody**, Professor of Biology, **Diane Peabody**, Research Professor of Biology, **Maura Tyrrell**, Professor of Biology, and **Jane Deluca**, Laboratory Instructor of Biology on *Markers to be Used in Analyzing the Honey-mushroom Life Cycle*. The research will focus on discovering molecular markers that can be used to detect the genetic differences among long-lived, vegetative stages of the life cycle. If successful, this will make it easier to test the hypothesis that fungal individuals have the potential to dynamically remodel themselves in response to variable environmental conditions. The project will result in a presentation at the Eastern New England Biology Conference as well as a co-authored manuscript that would be submitted for publication consideration in a refereed journal.

Katelyn Kurkul '09 and Nicole Landry '09 will work with **Christopher Poirier**, Assistant Professor of Psychology, on *Reducing the Own-age Bias in Face Recognition*. Many studies have documented that participants show an "own-race bias" in perceiving and remembering faces; that is, they perform better with faces of their own race. Over the past few years in collaboration with SURE scholars, Poirier has found support for a comparable "own-age bias" that influences developmental change in face perception. The team's work this year will focus on ways to reduce the own-age bias. Kurkul, an Elementary Education and Psychology major will help run experiments to investigate how to reduce the own-age bias caused by social categorization, while Landry, a Psychology major, will examine if inducing a positive emotional state in participants will reduce the own-age bias as well. The resulting data will be prepared for submission to a research conference at the Association for Psychological Science Annual Convention.

Eric Dombrowski '09 and Kristin Jackson '10 will work with **Cheryl Schnitzer**, Assistant Professor of Chemistry, on *Producing Biodiesel from Waste Vegetable Oil Using a Bubble Column*. Biodiesel is an alternative, renewable fuel derived from the vegetable oil of crops such as canola, corn, or soybeans. Biodiesel has many benefits, including: low toxicity, reduced greenhouse gas emissions to mitigate global warming, contribution to local agriculture, and reduced dependence on foreign oil. Biodiesel can be used in any diesel car or truck currently on the road when mixed with petroleum and has potential use in home heating oil. The goal of the research is to develop an effective and efficient way to purify biodiesel. The outcome of this project is a paper submission to the journal *Environmental Science and Technology* and three poster presentations around New England. Dombrowski will add to the team by returning as a SURE Leader.

Devon Heath '10, Christopher Kelly '10, Stephen Murphy '10, and Michael Mercadante '10 will work with **Leon Tilley**, Associate Professor of Chemistry, and **Marie Turner**, Assistant Professor of Chemistry on *Synthesis of Trifluoromethyl Ketones*. Using the work of previous SURE scholars (including Kelly, a Biology major) as a basis, the ultimate goal of the research is to synthesize and solvolyze a deuterium-labeled gamma-trimethylsilyl-alpha-trifluoromethyl sulfonate to complete an understanding of the mechanistic picture of this reaction. This reaction involves formation of a bridged ion, which ultimately leads to cyclopropanes and has potential application for synthesis of high-energy strained hydrocarbons. A key step in the proposed synthesis of the sulfonate involves a trifluoromethyl ketone intermediate. Several potential routes to the synthesis of the ketone will be investigated, including the oxidation of trifluoromethyl alcohols using organometallic catalysis. The project would combine Professor Tilley's knowledge of the synthesis of trifluoromethyl compounds with Professor Turner's familiarity with inorganic/organometallic catalysts. The outcomes of the project would include a compilation of the research material for publication in the Journal of the American Chemical Society as well as presentations at the American Chemical Society national meetings.

Molly Gallaher '09 and Michael Raposa '11 will work with **James E. Wadsworth**, Assistant Professor of History, on *A Circle of Hands: Cross-Cultural Trade in America before the European Invasion*. The research will focus on the hypothesis that the indigenous populations of the Americas constructed a functioning and viable hemispheric economic system that experienced alternating periods of intense contact and fragmentation with the rise and fall of political, cultural, and economic centers--for, there was nothing inherent in their geography, environment, worldview, or politics that rendered them incapable of constructing such a system. The project will force world systems theorists to revisit their own biases and it will remap our understanding of pre-modern economic systems worldwide. This research will result in a research paper and presentation at the North Eastern Historical Association bi-annual conference.

SURE Scholars will begin the program on May 27, 2008 for an eight or ten week period. They will engage in weekly meetings to discuss the progress of their projects and other topics of general interest, and will be paid a stipend for their full-time service. All SURE Scholars will present summaries of their summer's work at an all-campus poster session in the early fall.

Students and faculty members who wish to pursue a SURE research project for the summer of 2009 may contact the Office of Academic Development, Duffy 119, ext. 1069, for further information. The deadline for applications for the summer of 2009 is December 5, 2008.