

UNIVERSITY of HOUSTON

Undergraduate

Research Day 2010

THURSDAY, OCTOBER 14, 2010
4:00 p.m.

Elizabeth D. Rockwell Pavilion,
2nd floor, M.D. Anderson Library

Poster Presentations
by UH Undergraduates

Presented by the Office of
Undergraduate Research and
The Honors College



Undergraduate Research Day

Elizabeth D. Rockwell Pavilion

M.D. Anderson Library

October 14, 2010

4:00 p.m.

4:00-4:30 p.m. Viewing of Student Posters

4:30-5:00 p.m. Welcome and Remarks

John Antel

Senior Vice President for Academic Affairs and Provost

Stuart Long

Interim Vice President for
Research and Technology Transfer,
Associate Dean of Undergraduate Research and
The Honors College

5:00 p.m. Awards and Continue Poster Viewings

*Thank you to the Texas Learning & Computation Center (TLC²)
for printing the posters for the event, and the Office of Undergraduate
Discovery Programs for contributing toward the shirts and awards.*

*And a very special thank you to Provost's office, the Division of Research,
and The Honors College for their generous support of the
Office of Undergraduate Research.*

Welcome to our sixth annual Undergraduate Research Day. Today we invite you to consider how far we have come and where we are headed. We are here to honor the 43 students who participated in the 2010 Summer Undergraduate Research Fellowship program, as well as the many other undergraduate researchers who completed mentored research projects during the past year. Thanks to the efforts of our undergraduate researchers and their faculty mentors, the University of Houston is now home to a thriving undergraduate research culture—a culture that produces some impressive results. Just this past year, undergraduate researchers Matthew Reichl, Erica Fletcher, and Mariana Guerrero were awarded nationally competitive scholarships. These award winners got involved in research early on in their academic careers, and their research proved to be an integral component in enabling them to achieve their goals.

One of the most exciting aspects of conducting research is finally seeing the results of your work and sharing those results with others. For instance, some of these results you surely noticed at today's event were products that resulted from the combination of our University's strengths in both technology and design. These ideas—including a smarter diaper and variable-tinted auto glass—are the results of the collaboration of undergraduate research groups led by Farrokh Attarzadeh in the College of Technology and EunSook Kwon in the Gerald D. Hines College of Architecture. You might also have smelled another research project by Toshia Miracle and Samantha Porter, who were mentored by Jay Neal in the Conrad N. Hilton College of Hotel and Restaurant Management. Their research into the culinary tastes of the varied ethnic groups at the University has yielded two dishes, and aims to please the palates of many Cougars. Stop by and give it a try!

To the students presenting their research today: many congratulations. You have persevered through the setbacks, frustrations, and tedium of research; and we trust that today, you can see that those trials are a part of the production of new, exciting, shareable knowledge. Through your research experience, you

have not only furthered the development of your discipline, you have come to know your faculty mentor and have witnessed firsthand your professor's excitement for teaching and learning.

We also thank these students' faculty mentors. Through the time and energy that you give to these students, you are helping to produce the next generation of leaders. By guiding their work, you are providing an environment in which they can flourish and grow more confident of future successes.

Thanks as well should go to the faculty who served as the speakers in our SURF Brown Bag Lecture Series. By sharing your own experiences and advice, you helped model the life of a researcher and the deep commitment to one's work, both of which our students will take with them, whether into graduate school or a professional career.

The selection committee is another important element in the success of the Office of Undergraduate Research. This committee has the difficult task of selecting recipients for the PURS and SURF programs from an extremely competitive pool, and also provides us with feedback and advice on improving the Office's activities.

Thanks to all for celebrating this exciting day with us, and for your support of our undergraduate researchers.

Stuart Long

Interim Vice Chancellor/Vice President for Research and Technology Transfer, Associate Dean of Undergraduate Research and The Honors College



Karen Weber

Program Director, Office of Undergraduate Research



Undergraduate Research Day

October 14, 2010

4:00 p.m.

Elizabeth D. Rockwell Pavilion

**The Office of
Undergraduate Research**

The Honors College

University of Houston

211 M.D. Anderson Library

Houston, TX 77204-2001

(713) 743-3367

www.uh.edu/honors/undergraduate-researchundergrad-research@uh.edu*Booklet created by:***Karen Weber**, Director,

Office of Undergraduate Research

Samantha Vacanti, Student Assistant,

Office of Undergraduate Research

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Rigoberto “Gobet” Advincula, professor in the Department of Chemistry and Department of Chemical Engineering, is the recipient of the Faculty Award for Mentoring Undergraduate Researchers for 2010. Gobet has been working with undergraduates at the University of Houston since 2002, and in that time has mentored over 29 undergraduates.

The recipient of an NSF-CAREER award to mentor undergraduate and high school students, Gobet has also guided undergraduate research with the support of several other programs, including NSF-Research Experiences for Undergraduates, the Alliance for Minority Participation, the Alliances for Graduate Education and the Professoriate, and the American Chemical Society-sponsored Project SEED. With these sources of support, Gobet has initiated many students into the disciplines of chemistry and chemical engineering.

But more than financial backing, Gobet’s mentoring ability is what truly distinguishes him. “It is hard for me to imagine a better mentor for undergraduates in the research lab than Gobet,” wrote Simon Bott, Director of Undergraduate Affairs and Advising in the Department of Chemistry. “Gobet’s office is in the middle of the general group area, and I have never seen his door closed...[As] the Undergraduate Advisor for Chemistry, I need to encourage my students to explore research as part of their undergraduate experience. Having a colleague such as Gobet makes this an easy task.”

Many of Gobet’s students have gone on to distinguished careers of their own, in both medicine and academia, and students researching under his direction have felt both challenged and supported. “Perhaps what impressed me the most were not the facilities and the skills that I learned, but rather the mentoring environment and the esprit de corps of his group,” wrote Birte Wolff, a UH graduate and cur-

rent student at Baylor College of Medicine. “Dr. Advincula has the ability to organize and motivate all of his students. I could think of no other person more deserving than Dr. Advincula for this award. He is simply the best mentor one can have as an undergraduate student.”

Another former student, Dr. Arthur Rogers, echoes those sentiments, noting as well Gobet’s attentiveness to each one of his students. “The most lasting impressions for me were the mentoring environment and the group dynamics,” wrote Arthur, a Research Scientist in Chemistry at Rice University. “As the lab leader and coordinator, [Dr. Advincula] has the ability to organize and motivate all of his students. Even at times when he was obviously busy, he always made time for discussions with his students, in particular his undergraduate students.”

Gobet combines the most important qualities of a university professor: a commitment to research, and to passing on the skills needed for that research to continue. “Professor Advincula, an award winning scholar and researcher, has a deep commitment to the advancement of science education at our University through mentoring,” wrote David Hoffman, Chair of the Department of Chemistry. “With his dedication and seemingly tireless effort, I have no doubt that he will touch the lives and careers of many of our undergraduates in the years to come.”

Rigoberto C. Advincula
Professor
Department of Chemistry and
Department of Chemical
Engineering



SURF 2010 PARTICIPANTS

Comparison of Smyd-1 Splice Variants in Heart and Muscle Development

SURF Student: Angela Abouassi

Student's Major: Biology

Faculty Mentor: David Stewart

Heart disease is the number one killer in the United States. Researching the development of the heart is critical to finding the cause of congenital heart disease. A gene program regulates heart development, and Smyd-1 is a transcription factor involved in this program. In mice or zebra fish, loss of Smyd-1 results in heart defects. Smyd-1 can either activate or repress gene expression, but the mechanism for this is not well understood. With the hypothesis that there would be a difference between the Smyd-1 gene and its splice variant, Smyd-1b, due to critical structural differences, this research dealt mainly with performing PCR analysis to differentiate the two splice variants. Although Smyd-1b had been predicted to show a shorter size, no significant difference was seen. Continued experiments may lead to findings of a significant difference between the splice variants and ultimately a better understanding to the role of the genetic program and the ability to detect or repair problems in embryonic heart development.



Stress Control in Electrodeposited NiFe Thin Films

SURF Student: Adelanwa Adesanya

Student's Major: Electrical and Computer Engineering

Faculty Mentor: Stanko Brankovic

Residual stress in thin films is known to cause reliability and yield issues. In this project funded by National Semiconductors, Perm-alloy (Ni-80 Fe-20) films with various organic additives were electrodeposited on 200 μ m thick borosilicate glass cantilevers as substrate, and control over the level of residual stress was attempted. The stress was measured in-situ by cantilever bending method on an optical bench. The results show a good control over the residual stress by controlling the plating bath parameter additive composition.





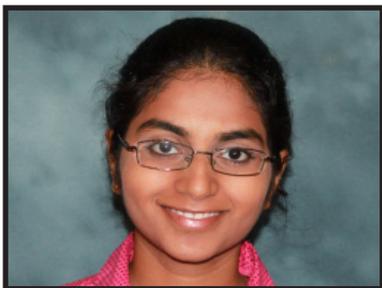
Comparative Analysis of Signed and Spoken Narratives

SURF Student: Sadaf Ali

Student's Major: Communication Sciences and Disorders

Faculty Mentor: Martha Dunkelberger

This study was designed to examine the representation of certain English morphemes (in, on, past tense, plurality, and possession) in American Sign Language (ASL), and to compare the use of ASL classifiers to English Nouns. The experiment was conducted using a word-less picture book and a single frame picture. Data was analyzed by acquiring a noun count (for English speaking participants) and a classifier count (for ASL using participants), as well as a count of the five studied English morphemes. While the existence of the five morphemes was confirmed, the ASL using participant used classifiers to depict some of the morphemes, instead of using a specific sign for them. This was especially apparent when using the morphemes “in” and “on” and other location indicators. This interesting development would benefit from a further, more detailed and specialized study.



Effect of Emotion on Conscious and Unconscious Information Processing of Human Vision

SURF Student: Pratima Anumolu

Student's Major: Biomedical Engineering

Faculty Mentor: Bhavin Sheth

The aim of this experiment was to investigate the effect of emotion on conscious and unconscious processing of visual perception. It included two groups A and B consisting of three sessions, each lasting for about 15-20 minutes. Each experimental session was comprised of rapidly presented 3x3 grids with similarly oriented surround patch, either all vertical or all horizontal. The subjects were asked to identify the orientation of the center patch, which could have identical orientation to surround patch or vary. Subjects were also asked to evaluate and enter their confidence level for each trial. For Group B, confidence rating from second session was analyzed and the subjects were given extra information to influence judgment for third session. The data from both the groups will ultimately be compared to assess how confidence/ emotion affected perception.



Building Structural Systems vs. Architectural Form

SURF Student: Nichole Bekken

Student's Major: Architecture

Faculty Mentor: Donna Kacmar

Understanding the relationship between structure and architectural form allows architects to weigh the aesthetics, strength, and intentions of a building. These issues are combined and are now evaluated relative to efficiency of energy, cost, space, and material use. This does not negate the more traditional needs of a building to define special differences (between private and public, work and play, etc.). This study looked at several buildings that engage this relationship between form and structure from a variety of perspectives: direct relationship to structure, indirect relationship to structure, and no relationship to structure.

In order to distinguish between the structure and architectural form, the building's elements were first broken down. Structure was defined as the elements needed for the building to stand without falling, while the architectural form elements could be everything else. After defining the structural elements, those elements were first examined; then, those acting as architectural form were defined; finally, elements not included in the structure that act as form intentions and not just aesthetics were also defined.



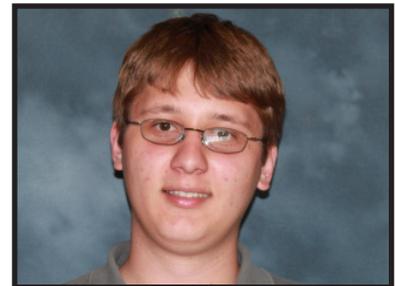
Performance Analysis of Per-Flow Queueing Schemes in Virtual Burst Assembly-Enabled Optical Burst Switching Networks

SURF Student: Dmytro Chenchykov

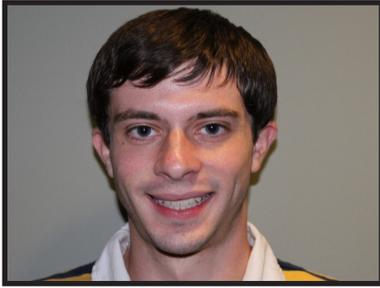
Student's Major: Electrical and Computer Engineering

Faculty Mentor: Yuhua Chen

This study engaged in the performance evaluation of fair queuing schemes in Virtual Burst Assembly-enabled Optical Burst Switching networks. Optical Burst Switching is a novel way of managing the flow of data in optical networks that eliminates the inefficiency of converting optical signals to electrical ones for processing at intermediate nodes in the optical network. Fair queuing helps ensure that no data flow may degrade the performance of the network as a whole by using more resources than it is allocated. Virtual Burst Assembly further improves the performance of the network by allowing for greater flexibility in the ordering and prioritization of data packet transmissions. The performance of the network without fair queuing was easily deteriorated by the presence of a "greedy" flow, while the Deficit Round Robin and Stratified Round Robin fair queuing algorithms protected the network from adverse effects.



Evaluating Effects of Leadership Transition in Terrorist Groups



SURF Student: Matthew Dickenson

Student's Major: Political Science

Faculty Mentor: Ryan Kennedy

The 2006 National Strategy for Combating Terrorism lists leadership targeting as the first of four priorities of action. Although leadership removal has been a common counterterrorism strategy for many governments, little empirical research exists on the success of these programs. How does terrorist violence change following the removal or departure of a leader? This study looks at eight prominent groups that survived multiple leadership transitions between 1970 and 2008. Leadership data were combined with attack information from the Global Terrorism Database into a cross-sectional time series dataset. The dataset was analyzed using multiple regression on the logged dependent variables: the number of attacks, victims, and casualties-per-attack in the months following leadership turnovers. This study finds that leadership transition generally causes a statistically significant increase in violence. However, the targeted removal of leaders in the uppermost tier of hierarchical groups can decrease the level of violence for up to six months.



Potential Gene's Interaction and its Impact to the Relative Fitness

SURF Student: Trang Duong

Student's Major: Biochemistry

Faculty Mentor: Timothy Cooper

The goal of this project was to identify interactions between beneficial mutations by examining and comparing the fitness of strains with different genetic backgrounds. Populations of the bacteria *Escherichia coli* were evolved for 2,000 generations in a series of environments containing glucose and lactose. During their evolution, a point mutation T->C in the promoter element of gene's segment was observed in one population selected in the environment that contained both glucose and lactose. In order to understand the consequences of this mutation, several different strains were constructed that contain this mutation in different genetic backgrounds and measured the fitness of these different strains in the different evolution environments. It was discovered that the mutation's effect depended on the environment, indicating it is a "specialist" mutation and predicting that it should occur only in some of the evolution populations.



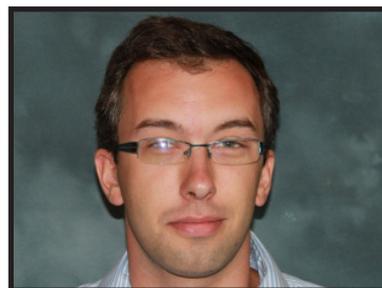
Selectivity of Imine Reactivity & Synthesis of Extensively Conjugated Cruciforms

SURF Student: Nicholas Eastham

Student's Major: Chemistry

Faculty Mentor: Ognjen Miljanic

This research centered on synthesizing extensively conjugated cruciforms that exhibit separated HOMO and LUMO gaps. These large molecules allow for the study of selective fluorescent properties through binding of target molecules. These target molecules change one of the molecular orbitals through the binding, and alter the fluorescent properties. Another portion of the research was the study of electron rich anthracene derivatives for use as metal organic framework constituents. These compounds can lead to post synthetic modification of MOFs through Diels-Alder reactions. This would allow for easy gas uptake and desorption through a simple reversible reaction. The selective properties of the Diels-Alder reactions with imine dienophiles is known and studied. This reaction is useful in its selectivity of targeting electron poor imines. Such selectivity can be implemented to create a self-sorting reaction that produces only two from a large selection of possible products.



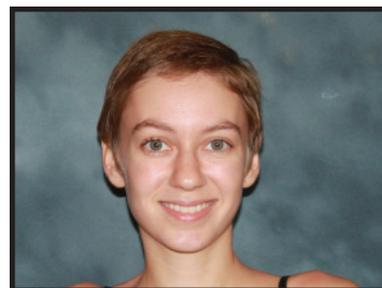
Petroleum, Politics, and Transnational Oil Companies in the Gulf of Guinea, Africa

SURF Student: Anna Sophia Fields

Student's Major: History

Faculty Mentor: Kairn Klieman

This study assisted with the composition of Dr. Kairn Klieman's book, *Before the "Curse": Petroleum, Politics, and Transnational Oil Companies in the Gulf of Guinea, Africa, 1960-1980*. The book recounts the history of relations between transnational oil companies, their home governments, and African rulers during the era of African independence. This is a very important topic today, both locally and nationally; estimates project that by 2015 twenty-five percent of the US oil will come from the Gulf of Guinea. This industry has brought much wealth to the people of Texas. In Africa however, they are experiencing the 'oil curse'; a phenomenon which occurs when underdeveloped oil-rich nations have failed to prosper despite massive infusions of wealth from oil revenues. As dependence on oil revenue increases, other state building processes tend to stagnate or cease completely; leading to extreme poverty. The research Anna performed helps explain the extent of American oil companies' investment and development of the downstream sector prior and during WWII in the The Gulf of Guinea. By placing developments within a precise historical context, they are able to identify patterns of interaction between oil companies and African governments (both colonial and Post-independence), to help explain the roots of problems today.



Richard Rodriguez: The Man and the Scholar



SURF Student: Sylvia Garcia

Student's Major: English

Faculty Mentor: Paul Guajardo

This research on Richard Rodriguez supported the compilation of two anthologies: one of his work, and one of criticism of his work. Because of his attraction to controversy, Richard Rodriguez is recognized in the Latin American community more as a man of discord rather than as an intellectual who has made substantial contributions to society. However, his work has the potential to change the perspectives of modern society and encourage Latin Americans to work against the tide of prejudice and hate. By compiling these anthologies, more exposure will be brought to Richard Rodriguez the intellectual and not Richard Rodriguez the dissenter. Richard Rodriguez emphasizes both individuality and a common suffering amongst people in an attempt to erase the lines that divide them. He uses a combination of personal narrative, history, and philosophy to illustrate his points. With such a unique perspective on the problems plaguing our society, Rodriguez's writings strive to obtain a kind of unity that has no guidelines and embraces the differences of each individual.



Gender and Reciprocity in Computer-mediated Negotiations: The Role of Dialogue



SURF Student: Cassandra Garza

Student's Major: Management Information Systems

Faculty Mentor: Norman Johnson

The goal of this study is to examine the different ways in which males and females respond to each other and their own gender as they negotiate. This study seeks to understand this issue in a context in which people communicate via IM because of the growing popularity of this medium. The study focused on two kinds of dialogues - negotiation and persuasive - and on reciprocity that drives the process of negotiation. The prediction is that females tend to use persuasive dialogue more than males do, whereas males tend to use negotiation dialogue more than females do. Another prediction is that males will make more reciprocity than females. Based on a small sample of data, support for our predictions was found. As negotiation continues to be a part of our daily lives, the results help us to know more about negotiation in terms of gender and how what we say and do affect the process.



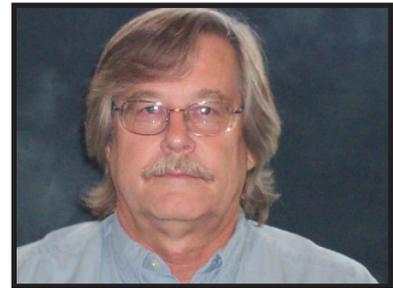
African American Adaptation to Life in the Rural South: by Archaeological Excavation and Researching the Historical Record

SURF Student: Meghan Graff

Student's Major: Anthropology

Faculty Mentor: Kenneth Brown

African Americans who were involved in the slave trade went through many different types of adaptation to life in the new world. One of the more significant adaptations was the change in diet. Magnolia Plantation in Natchitoches, Louisiana, where Dr. Brown has conducted archaeological excavations, provides rich evidence of what types of food African Americans ate during the 150 years of occupation. Examining the faunal remains and looking at the store records from the plantation store has provided data that shows specific foods that were raised, caught, or purchased. The research that has been conducted on this topic is not very well known, and by reviewing the artifacts and researching the historic record more can be understood on this subject. Continuing this research will supply more information on what types of food the people ate and offer more insight on their everyday lives.



Identifying the Downstream Gene Targets of Ets2

SURF Student: John Harger

Student's Major: Biology

Faculty Mentor: Robert Schwartz

After cardiac tissue is damaged, the heart muscle does not normally regenerate. However, in combination with the cardiac transcription factor Mesp1, Ets2 can reprogram human dermal fibroblasts into cardiac muscle cells. The purpose of this experiment was to identify downstream gene targets of the Ets2 transcription factor in order to better understand the mechanism of reprogramming adult somatic cells into heart cells. Chromatin immuno-precipitation was done on day four mouse embryoid bodies to detect endogenous Ets2 targets. Sequencing and bioinformatics were then performed to determine the target's exact chromosomal locations. It was expected that Ets2 targets would be found to be important cardiac genes or cardiac progenitors, and that they may be in close proximity to Mesp1 gene targets.

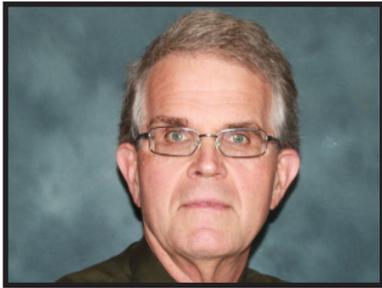


Print to Web Marketing: A Multimedia Solution

SURF Student: Chenlong He

Student's Major: Organizational Leadership and Supervision

Faculty Mentor: Jerry Waite



In this digital information age, much of the printing industry is either closing down or consolidating. According to the U.S. Commerce Department Quarterly Financial Report, in the course of 10-year period (Q1-2000 to Q1-2010) the printing industry's shipment and profits sharply dropped 91%, from \$14.94 billion to merely \$1.35 billion (inflation adjusted). In addition, the U.S. Bureau of Labor and Statistics foresees a 16% decrease in employment of all occupation within the print industry by year 2018. However, with print to web marketing, the advertisers are able to offer more jobs and profits for these struggling printing companies. The purpose of this research is to measure the print technology's ability to drive online traffic. This study delves into the integration of different marketing channels such as print, web, and mobile. In addition, this investigation compares the various ROI's (Return On Investment) of different advertising mediums to print marketing. The general assessment and case study within this examination help to create parameters for targeting consumers in different gender and age groups. These findings can be essential in developing an effective cross-media marketing campaign.



The Criterion Validity of the Short Mood and Feelings Questionnaire in a Sample of Youth at Risk for Depression

SURF Student: Levi Herman

Student's Major: Psychology

Faculty Mentor: Carla Sharp



The Short Mood and Feelings Questionnaire (SMFQ) was designed as a screening tool for detecting signs and symptoms of depressive disorders in children and teens ages 8-18. The aim of this study is to assess the criterion validity of the SMFQ against an interview-based measure of depression, the CDISC, using Receiver Operating Characteristic curve analysis in a community sample of female adolescents ages 10-14 (mean 11.7). Mothers of participants were screened using the SMFQ, and participants were assessed with the CDISC to determine their depression status. Current n=14, data analysis indicates a correlation of .378 between SMFQ scores and number of depressive symptoms as measured by the CDISC. Results of the current study will provide empirical evidence in support of the SMFQ as a screening measure for depression and will contribute to growing body of literature on the validity of the SMFQ within community samples.

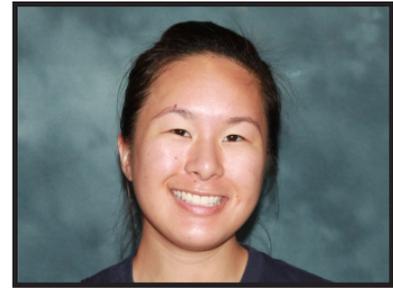
Neighborhood Safety and Attractiveness Influence Physical Activity Among African American and Hispanic or Latina Women

SURF Student: Angela Ho

Student's Major: Human Nutrition and Foods

Faculty Mentor: Rebecca Lee

The purpose of this study was to investigate the relationship between neighborhood safety and attractiveness and Physical Activity (PA) in a sample of African American (AA) and Hispanic or Latina (HL) women participating in Health Is Power. Women (AA N=202 and HL N=107) who enrolled in the study were middle-aged (M=45.8 years), overweight (M BMI=34.2 kg/m²) and largely sedentary (M accelerometer measured PA=19.6 min/day). Self-reported PA was measured by the International Physical Activity Questionnaire (IPAQ) long form and objectively measured PA was collected using an accelerometer at T1 and T2. Safety and attractiveness were measured using the Pedestrian Environment Data Scan (PEDS) tool. Bivariable associations showed that as safety ($r=-.144$) and attractiveness ($r=-.149$) for bicycling increased, self-reported walking decreased ($p<.05$). Linear regression analyses indicate attractiveness for bicycling predicted T2 accelerometer measured PA ($p=.025$), after adjusting for covariates. Results from this study suggest that neighborhood environment plays a role in objectively measured PA.



Design of a Controller for a Conductive Self Heating Concrete System

SURF Student: Michelle Ho

Student's Major: Civil Engineering

Faculty Mentor: Gangbing Song

An electrically conductive self heating concrete system was created for the purpose of deicing through “sandwiching” a carbon fiber mat, a highly conductive material, inside a concrete block sample. To accomplish efficient deicing without the need for constant manual input of voltage, a controller was designed through the combination of a fuzzy logic and PID feedback controller. This controller was designed to set the difference between the desired (4°C) and actual surface temperatures as close to zero as possible. The results of 4 different cases (air temperature at -12°C, -6°C, -3°C, and 6°C) show that the controller raised and kept the actual surface temperature above the freezing point, 0°C.





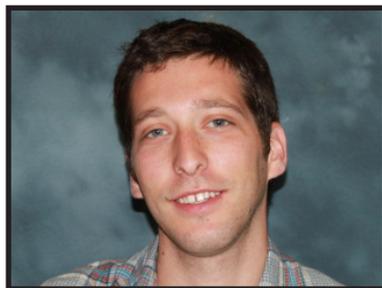
Docking of a Tetra-Arginine Peptide with A-Form Canonical Duplex DNA

SURF Student: Abdulrahman Ibrahim

Student's Major: Chemistry

Faculty Mentor: Bernard Pettitt

In the course of this study, the program AutoDock was utilized to investigate the binding of protamines to DNA. Towards this end, a tetra-arginine peptide, used to simulate a protamine, was docked to a 12-mer canonical DNA duplex comprised solely of adenine and thymine base pairs. Preliminary results suggest the peptide typically docks with its backbone somewhat above or below the major groove of the DNA while the positively-charged guanidinium ends of the side chains curl along the backbone of a negatively charged DNA strand. Results were visualized in VMD and lend credence to the possibility that electrostatic interactions between the peptide and DNA were a primary determinant of the docking configurations. Future studies could make use of a B-form DNA duplex, unlike the A-form DNA used in the study, to confirm that the unique structural properties of the DNA congener did not impact the results. The use of a larger duplex or, alternatively, a duplex containing cytosine and guanine may also improve the applicability and generality of the results.



Physiological Responses to Walking and Running During a Backpack Load-Carriage Task

SURF Student: Yuval Klein

Student's Major: Kinesiology-Sports Administration

Faculty Mentor: Richard Simpson

This study aims to understand the consequences of walking or running at fixed speeds while wearing a backpack. Scientific information from this investigation will improve our knowledge on the loads that are placed on the legs when wearing a backpack and might help us to find better ways to reduce the risk of injuries in military recruits. By identifying the physiological demands of walking or running at fixed velocities during backpack load-carriage tasks, the study may then be able to provide baseline ergonomical data for future backpack and chest rig designs to improve soldier load carriage performance.



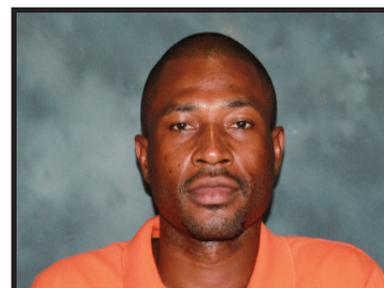
Evolutionary Consequences of *Lac* Operon Regulation to Better Understand How Organisms Adapt to Environmental Changes

SURF Student: Zakari Kwota

Student's Major: Biochemistry

Faculty Mentor: Timothy Cooper

Microorganisms must regulate gene expression to convert environmental signals into appropriate physiological changes. This study focuses on experimentally evolved populations of bacteria and determines how changes in regulation of a key group of genes has contributed to their adaptation. It was observed that some populations had evolved to constitutively utilize lactose while others did not. Sequencing of targeted regions – the genes *lacO* and *lacI* – that control use of lactose found a number of evolved mutations. Representative mutations in *lacO* and *lacI* were added individually into the ancestor to measure their fitness effects in the evolution environments independently of other mutations that may have occurred during evolution. Surprisingly, though *lacO* mutants evolved in an environment with glucose and lactose, they were not more fit here, raising the possibility that epistatic interactions, where the effects of mutations depend on their genetic background, might increase the benefit of *lacO* mutations in the evolved strains. Thus, environmental response through gene regulation is a conspicuous feature of evolution.



Drug Discovery: Integrated Virtual Screening And High Throughput Screening for Identification of Novel Candidates As Antagonist Drugs Targeting Prostaglandin E2 Subtype-1 Receptor

SURF Student: Caroline Lowry

Student's Major: Biology

Faculty Mentor: Ke-He Ruan

The prostaglandin E2 ligand, when bound to its subtype EP1 receptor, has been found to be involved with cancer and seems to promote tumor growth. Therefore this study tested similar compounds for their likelihood of binding with the receptor using a virtual model with phenyl compound screening. The top five compounds found from the virtual screening were then tested in a binding assay along with their like compounds, 80 for each of the 5 plates. The assay tested their ability to be competitive with the ligand PGE2 for affinity to bind with the receptor. Radio-labeled PGE2 was added to the cells, along with the compound, and the cells were read for radioactivity level to determine the amount of compounds that bound with the cells. The competitive compounds were identified and can be used in future projects to determine their ability to act as a drug to block this receptor.



Molecular Modelling of the p53 C-terminus and Several Binding Partners



SURF Student: Ian Mitchell

Student's Major: Physics, Mathematics

Faculty Mentor: Margaret Cheung

An all-atom model of the C-terminus of p53 and several selected binding partners was created using molecular dynamics to model the binding process. As p53 is an important tumor suppressant which depends on its binding ability to function, and its failure to function properly is linked to the development of many cancers, understanding how its binding takes place is important for understanding how it works and therefore for understanding the formation of cancerous cells. While modeling is incomplete, the completed tests indicate that this is an effective way to investigate the p53 binding process: it is relatively computationally cheap while retaining a reasonable amount of detail. This modeling will hopefully lead to a better understanding of this important protein's functionality.



Meta-Landscape Architecture: A New Perspective on Research



SURF Student: Santiago Morales

Student's Major: Psychology

Faculty Mentor: Daniel Price

Recent advances in technology have allowed scientists to gain important insights into the mechanisms responsible for the psychobiological response to stress; however, despite impressive scientific progress in biology, little headway has been made toward the understanding of stress in its wider, environmental context. As a result, the present study evaluates an ample selection of traditional and emerging paradigms on the subject of stress, and posits a new research method; broad enough in scope to concurrently address the specificity of biological mechanisms and the abstract dynamics of natural systems. To that end, a new model based on *meta-landscape architecture* is introduced and demonstrated via a recent survey by the American Psychological Association entitled *Stress in America*. Results confirm that using meta-landscape architecture, an integrated model of dissimilar systems can be successfully conceptualized, built and tested with statistical data.



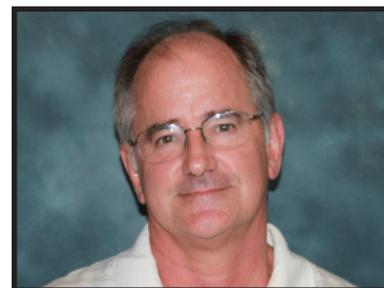
Synthesis of Homoleptic First Row Transition-Metal Ketimide Complexes

SURF Student: Jennifer Nguyen

Student's Major: Biochemistry

Faculty Mentor: David Hoffman

The goal of this project was to study homoleptic transition metal complexes with nitrogen-based ketimide ligands ($R_2C=N^-$) as potential precursors to transition metal and transition metal containing thin films. The syntheses of the first row transition-metal ketimides $Cr(N=C-t-Bu_2)_4$, $[Ni(N=C-t-Bu_2)_2]_2$, $[Mn(N=C-t-Bu_2)_2]_3$, and $[Co(N=C-t-Bu_2)_2]_3$ were accomplished by using salt metathesis reactions. Crystals of the synthesized complexes were characterized by using 1H NMR, ^{13}C NMR, and X-ray crystallographic analyses. Interestingly, $Cr(N=C-t-Bu_2)_4$ appears to be the first example of a diamagnetic 4-coordinate $Cr(IV)$ complex. Future research will determine the thermal stability and volatility of the new complexes to assess their potential as thin film precursors and the electronic structure of $Cr(N=C-t-Bu_2)_4$.



Adiposity Changes During a Physical Activity Intervention for Minority Overweight Girls

SURF Student: Jensine' Norman

Student's Major: Kinesiology

Faculty Mentor: Norma Olvera

Childhood obesity is becoming a major health concern, with one in three children in America being overweight or obese. These children are at a higher risk of developing high blood pressure, Type 2 diabetes and chronic obesity-related health problems. Minority children are disproportionately affected by obesity due to increased sedentary behavior and decreased physical activity. A summer intervention program, BOUNCE, was developed to target overweight minority girls ages 9-14. BOUNCE (Behavior Opportunities Uniting Nutrition, Counseling and Exercise) combines nutrition education, counseling classes and physical activities to provide a healthy lifestyle program. The purpose of the study was to test the effectiveness of the BOUNCE intervention. Thirty-nine overweight Hispanic and African American girls participated in the four-week intervention. Adiposity indicators (e.g., weight, body fat, waist circumference) were measured both pre- and post-intervention. There were significant changes in weight ($p = 0.001$) and body fat ($p = 0.000$). There was also a significant increase in physical fitness indicated by a decrease in the one-mile run time. There was a non-significant decrease in waist circumference ($p = 0.151$). The BOUNCE intervention was considered successful in decreasing adiposity indicators and increasing physical fitness in overweight minority girls.



Effects of L-Dopa Medication and Deep Brain Stimulation on the Balance of Patients with Parkinson's Disease

SURF Student: Jasmine Patel

Student's Major: Biomedical Engineering

Faculty Mentor: Charles Layne



Parkinson's disease (PD) is a neuromuscular disorder that affects motor skills (i.e. walking and balance), resulting in a higher risk for falling. Two methods of treatment, oral medication (L-Dopa) and deep brain stimulation (DBS), are used to overcome PD symptoms. The goal of this project is to determine whether either method yields a decrease in falls among PD patients. Participants were either on oral medications or receiving DBS in one of two areas of the brain (globus pallidus or subthalamic nucleus). Participants' balance and recovery time were tested on a platform with the ability to tilt and move horizontally, making it useful in simulating falls. Balance scores and electromyogram (EMG) data were collected and analyzed to determine changes in balance and muscle activity. Conclusions will be used with future research to make definitive claims about a method, and in clinical settings to determine which method may be best for specific patients.

Interconnecting a Series of Offshore Wind Farms Along the U.S. Gulf Coast to Study the Potential Smoothing Effects Upon Overall Power Output and to Analyze the Risks of Development within this Region

SURF Student: Ethan Pedneau

Student's Major: Mechanical Engineering

Faculty Mentor: Ralph Metcalfe



Intermittent power output from a single wind farm places a burden on the power grid that will steadily grow in cost as the scope of wind power increases to around 20% of the total power supply. By interconnecting a series of theoretical wind farms over a meteorologically diverse region, one could steady the power output. This study applied that concept along the U.S. Gulf Coast using five years of wind speed data from nine buoys to determine the degree of smoothing effects upon power output. The result was a reduction in intermittency by a factor of 1.20– 2.24. Also, twenty years of hurricane data were used to determine that any wind farm consisting of Siemens SWT 3.6 – 107 wind turbines within the study region is under threat from a strong hurricane once every five years. Regional weather patterns and their relation to power output and standard deviation were also studied.

Directed Dewetting of Polystyrene Thin Film into Triangle Droplets

SURF Student: Trang Pham

Student's Major: Chemical Engineering

Faculty Mentor: Gila Stein

The objective of this research project is to generate arrays of microscale triangles by directed dewetting of polystyrene thin films on topographic pre-patterns. Silicon wafers are patterned with arrays of microscale hexagonal holes using photolithography and wet etching. Patterned substrates are coated with thin films of polystyrene and then heated above the glass transition temperature to promote dewetting. The dewetting process is monitored in-situ with optical microscopy, and final droplet structures are also imaged with atomic force microscopy. The rate of triangle formation depends on temperature and film thickness. The triangle size depends on film thickness and dimensions of the topographic pre-pattern. Future work will explore methods to template nanoscale triangles in “bowtie” configurations for plasmonic devices.



The Historical Imagination of Miss Ima Hogg

SURF Student: Ruchira Podali

Student's Major: Psychology

Faculty Mentor: Charles Orson Cook

Often called the First Lady of Texas, Ms. Ima Hogg was not only a philanthropist but also a leader in the cultural sphere of Houston. A connoisseur of the arts, her extraordinary collection of American antiques can still be seen at Bayou Bend, her former home, now part of the Museum of Fine Arts. Even though several historians have captured her illustrious life in various works, her fascination with history has not been sufficiently explored. The present study delves into how Ms. Hogg's concept of history informed her perspective and her activities. An interesting finding of this study is that Ms. Hogg constantly strove to link Texas, America and Europe. Her efforts at Bayou Bend and other historic restorations show how she used history to express this peculiar world view.





Critical Temperature Research with Superconductors

SURF Student: Ashley

Student's Major: Electrical and Computer Engineering

Faculty Mentor: Venkat Selvamanickam

The objective of this research was to determine how a change in the composition of the superconductive samples affected the superconducting properties (critical current and critical temperature) of said samples. In particular, this research worked to find/define this relationship by running many different tests on hundreds of different samples for critical temperature and critical current.



The Feminine Mystique in Ancient Sparta: Spartan Women and the Limits of Civic Education

SURF Student: Krystofer Redden

Student's Major: Political Science, History

Faculty Mentor: Susan Collins

Ancient and modern thinkers alike praise Sparta for its civic devotion, longevity, and uniqueness. The Spartan regime constituted a whole way of life, aimed at war and prizing courage as the ultimate virtue. But for all its elevation of men and manliness, Sparta was ruled by women; indeed, Plutarch described Spartan women as the only women who could rule over men. This investigation analyzes their education, and particularly how they were pivotal in ensuring the perpetuation of the most long-lived and distinctive regime in ancient history. My analysis of this education clarifies the role of women as civic actors in the Spartan regime—their peculiar power and freedom—as well as the limits of a civic education that aims to reshape the private sphere of the household with a view to the common good.



Calculating Thermodynamic Stability of DNA in Water Using Converged Integral Equations

SURF Student: Smith Sarkar

Student's Major: Chemical Engineering

Faculty Mentor: Bernard Pettitt

In order to observe the stability of DNA in polar solvents, an oligomeric duplex was dissolved in water. The changes were photographed over an interval of few nanoseconds. Using this data, the co-ordinates of the DNA were identified. This information was critical in determining the free energy value of the system. The results prove that the free energy value increases with time, which further indicates an increase in system stability as time goes by. Thus the system becomes more stable with time and eventually reaches equilibrium.



Development of Hierarchically Ordered Polymer Breath Figures

SURF Student: Derek Schilling

Student's Major: Chemical Engineering

Faculty Mentor: Ramanan Krishnamoorti

Thin films of polystyrene and polystyrene attached to silica nanoparticles are spin coated onto silicon to produce breath figures that arrange themselves into hexagonally close packed systems due to thermocapillary flow. The introduction of silica nanoparticles into the polystyrene is monitored to see how it affects the formation of pores and the development of hierarchically ordered structures. Humidity, air flow, and concentration of solution all affect the formation of uniform droplets without coalescence as well. A number of biofunctional and sensory applications exist for these highly ordered structures.





A Pilot Study on the Extinction of Conditioned Responses During Sleep

SURF Student: Andrew Serranzana

Student's Major: Biomedical Engineering

Faculty Mentor: Bhavin Sheth



Previous studies have examined sleep in terms of its retroactive effect on human fear conditioning. In this pilot study, a protocol was created to test for the extinction of conditioned responses following exposure to an extinction paradigm during sleep. Subjects were conditioned to respond to two distinct tones (CS+) by pairing the tones with a mild, 0.5 second shock. A third tone (CS-) was presented without shock. During a one-hour sleep period, one CS+ was presented at regular intervals, unpaired with shock (CS+E). Then, subjects were roused, and the skin conductance response (SCR) to each CS was measured. The hypothesis was that CS+E would produce a smaller SCR than the CS+ not presented during sleep. In most subjects, however, the SCRs for both CS+ were equal. Possible causes for this outcome were identified, and will be corrected in the main study.

Drug Discovery for Inhibition of ROCK1 in Cardiac Fibrosis

SURF Student: Archana Shah

Student's Major: Biology

Faculty Mentor: James Briggs



As the leading cause of death in the United States, cardiovascular disease encompasses many serious conditions including congestive heart failure. This debilitating illness causes the heart to become permanently enlarged as a result of irreversible fibrotic changes instigated in an enzymatic cascade induced by stress and fluid overload. Studies with mice indicate the down regulation of the ROCK1 protein reduces fibrosis and limits the destructive remodeling the heart, demonstrating a strong rationale for developing ROCK1 specific inhibitors. Determining a suitable target region for inhibitory drug design based on mapping of bound ROCK1 to an inhibitory polypeptide, molecular dynamics simulations of solvated ROCK1 were generated and their trajectories clustered to identify representative structures. Favorable interaction fields were identified virtually using chemical features probes. The analysis of this data generated dynamic Pharmacophore models for screening through a database of existing compounds with acceptable pharmacological properties as potential treatment for the cardiomyopathy.

Experimental Gestures: Public Art in Houston

SURF Student: Lindsey Slavin

Student's Major: Sculpture

Faculty Mentor: John Harvey

Houston has a unique, multifaceted art culture that reflects its population, history, and tenor. This project entailed looking into the nature of Houston's art scene and discovering how accessible it is to emerging artists. After interviewing local artists Lee Littlefield and the Art Guys and researching art, art history, and art theory, the next step was to respond by creating a series of works with a focus on public art. Through experimentation, it was found that integrating a performance component was a successful method in making the art pieces become both collaborative and public. Projects of this nature allow artists to broaden the scope of their portfolios, network with other artists and galleries, and contribute to Houston's ever-growing art scene.



Investigation of the Structural and Functional Physical Properties of $\text{CsLa}_{1-x}\text{Bi}_x\text{Nb}_2\text{O}_7$; $0 \leq x \leq 1$

SURF Student: Stephen Tam

Student's Major: Chemistry

Faculty Mentor: P. Shiv Halasyamani

The novel solid solutions of $\text{CsLa}_{1-x}\text{Bi}_x\text{Nb}_2\text{O}_7$ ($0 \leq x \leq 1$) were synthesized by the conventional solid-state method. Their crystal structures and functional properties were characterized by single crystal X-ray diffraction, UV-Vis diffuse reflectance, and second harmonic generation (SHG) measurements. Both end phases are known as nonpolar centrosymmetric (CS) ($x = 0$) and polar noncentrosymmetric (NCS) ($x = 1$) materials where the doubled perovskite layers of $[\text{La}(\text{Bi})\text{Nb}_2\text{O}_7]$ —separated by Cs^+ layer are exhibited. The purity of the solid solutions was confirmed by powder X-ray diffraction (PXRD) where systematic peak shifts toward lower angle were observed with increased x value of Bi^{3+} . The SHG measurements indicate that efficiency of the solutions decrease as the x value decreases. Remarkably, $\text{CsLa}_{0.9}\text{Bi}_{0.1}\text{Nb}_2\text{O}_7$ ($x = 0.1$) is still SHG active, comparable to $\alpha\text{-SiO}_2$, because the solid solution is polar NCS. This is indicative of nonpolar CS to polar NCS structural change that is occurred even below $x = 0.1$. Also, it points out the origin of the polar NCS structure resulted from the stereo-active lone-pair on Bi^{3+} . Furthermore, it was found that additional polar NCS to polar NCS structural changes would be possible from the PXRD study. To determine their precise crystal structures, the single crystal X-ray diffraction studies are in progress. As reported for $\text{CsBiNb}_2\text{O}_7$ that is hygroscopic, this study failed to obtain intact pyroelectric, ferroelectric, and piezoelectric properties of the polar NCS solid solutions.



Nanomaterials Synthesis for Biomedical Applications

SURF Student: Karen Taniguchi

Student's Major: Mechanical Engineering

Faculty Mentor: Li Sun



For this summer research, we focused on electrochemical synthesis of iron based nanoparticles and nanowires and evaluating their toxicity. The ultimate goal was to develop effective nanosynthesis techniques to produce a new type of biocompatible structures for MRI applications. These nanomaterials will process designable magnetic properties to enhance the imaging contrast in MRI and will be safe when injected into human body. Biocompatibility of nanomaterials under certain synthesis condition and quantified concentrations has been evaluated using RAT-2 cell culture. Fluorospectrometer was used for detecting the nanomaterials and determining the relation between the solution concentration and relative fluorescent unit (RFU). To better understand the growth mechanism of magnetic nanomaterials at the nano-scale, in-situ synchrotron x-ray study has been carried out at Argonne National Laboratory. The relation between nanomaterials electrodeposition, solution concentration and deposition conditions has been studied using x-ray fluorescence spectroscopy, and the nanowire composition was determined from micro-beam diffraction by pure iron.

Effects of Mutation in the C1B Subdomain of PKC θ on Activator Binding

SURF Student: Zarana Trivedi

Student's Major: Anthropology, Biology

Faculty Mentor: Joydip Das



Protein Kinase C theta (PKC θ) belongs to PKC super-family of serine/threonine-specific kinases, which is expressed exclusively in T-cells and regulates the T-cell mediated immune responses. Selective blocking of PKC θ can stop the autoimmune responses but currently there is no selective PKC θ blocker. Designing selective PKC θ blockers by targeting its kinase domain is a problem due to the high sequence homology among more than 500 kinases in the human genome. Diacylglycerol (DAG) and Phorbol esters (PE) bind to the C1 subdomains (C1A and C1B) to activate PKC θ . Thus C1 subdomains can be the target for designing the selective PKC θ blocker. Specific targeting of the PKC θ C1 subdomains requires the understanding of the 3D structure and activator binding residues in PKC θ C1 subdomains. Using virtual molecular docking of known DAG and Phorbol ester analogs in PKC θ C1B crystal structure, we identified the possible interacting residues. Based on docking information mutants (Y17G, T21G, W31G, L33G and Q36G) were designed and expressed to study the effect of mutations on ligand binding in the PKC θ C1B mutants compared to the wild type.

Effects of A8V, D145E, and E134D Mutations on Calcium Binding and Dissociation with the Troponin Complex

SURF Student: Karen Veloso

Student's Major: Biochemistry

Faculty Mentor: Svetlana Tikunova

Hypertrophic Cardiomyopathy (HCM) is a cardiac disease characterized by an enlarged left ventricle, leading to sudden cardiac death. This research focuses on troponin C by comparing calcium affinity and rates of calcium dissociation between wild type cardiac troponin C (cTnC) and three HCM-linked mutations (A8V, D145E, and E134D). Troponin C is a subunit of the troponin complex that contains calcium-binding sites that when bound generates processes leading to muscle contraction. Muscle relaxation occurs when calcium ions dissociate from troponin C. This study reports that the A8V mutation decreased calcium affinity of the regulatory site of troponin C reconstituted into the troponin complex, while the D145E mutation increased calcium affinity. However, the A8V and D145E mutations slowed the rate of calcium dissociation. Experiments involving a troponin complex reconstituted with PKC phosphorylation mimic of troponin I showed that calcium affinity had decreased and the rate of calcium dissociation had increased for control and mutants. By assessing how these mutations affect the calcium-binding properties of troponin C, treatments for mutations that are linked to HCM can be developed and the molecular pathogenesis of the disease can be better understood.



Effectiveness of Optical Coherence Tomography in Differentiating Retroperitoneal Liposarcoma

SURF Student: Astha Vijayananda

Student's Major: Biomedical Engineering

Faculty Mentor: Kirill Larin

Liposarcoma (LS) is a rare form of cancer that originates in fat cells of soft tissues. Two classifications of LS, well-differentiated and dedifferentiated, account for over 90% of cancers occurring in the abdominal and retroperitoneal cavities. The most common treatment available today is surgically removing the tumor from the body; however, there is a high rate of recurrence associated with surgical resection due to the difficulty in distinguishing between malignant cells and the surrounding normal tissue. Current imaging methods of differentiating normal and abnormal tissues have poor resolution and therefore do not accurately detect all leftover malignant cells. Therefore, a more effective imaging technique is necessary to ensure that all of the malignant cells are removed to eliminate any chances of the reappearance of cancer. In this novel study, the effectiveness of Optical Coherence Tomography in serving this purpose is tested.





Identification of Molecular Targets Involved in Oxidative Stress Induced Anxiety-Like Behavior in Rats

SURF Student: Craig Vollert

Student's Major: Psychology

Faculty Mentor: Samina Salim



Anxiety disorders affect approximately 40 million people in the United States annually. Despite an enormous increase in anxiety disorder research, the mechanisms in the brain that regulate anxiety are poorly understood. Classical neurotransmitters such as GABA and serotonin have been implicated in the etiology of anxiety, thus making them a popular focal point for therapeutics. Unfortunately, due to serious side effects with drugs that interfere with GABA and serotonin, a vast majority of anxiety patients are unresponsive, costing almost \$42 billion annually in lost productivity. Therefore, improving the understanding of anxiety with novel theories is imperative. While the exact mechanism is unclear, this study investigates the putative role of several key signal transduction molecules that more than likely play an important role in the etiology of pathological anxiety.

SURF STUDENTS have the privilege of attending the weekly Brown Bag Lectures, in addition to conducting their research projects with their faculty mentors. The lecture series presents a wide range of topics that are of interest to undergraduate students, such as confronting issues related to research ethics, applying to graduate and professional school, and learning to become proficient in the language of their particular disciplines.

The next few pages are comprised of biographical information on some of our highly esteemed lecturers that participate in our program. Through their involvement, they contribute in making the Summer Undergraduate Research Fellowship program a first-rate research program at the University of Houston.



SURF 2010 LECTURERS

P. Shiv Halasyamani

Dr. P. Shiv Halasyamani is a Professor in the Department of Chemistry at the University of Houston. Dr. Halasyamani teaches a wide range of courses, such as chemistry for honors freshman, descriptive inorganic chemistry for undergraduates, and solid state chemistry for graduate students. His research focuses on the synthesis and characterization of new oxide and halide materials with technologically important properties. Throughout his career, he has received many accolades, such as the NSF Early Faculty CAREER Award, the ACS Petroleum Research Fund Type G and AC Grants, and the Beckman Young Investigators Fellowship. He received his B.S. at the University of Chicago, his Ph.D. at Northwestern University, and was a Postdoctoral Fellow and Junior Research Fellow at Oxford University before arriving at the University of Houston. Dr. Halasyamani lectured on research ethics this past summer to the SURF participants.



Andy Little

Andy Little is the Coordinator of Academic Advising for The Honors College and teaches in The Human Situation sequence. A graduate of The Honors College, he has been advising and teaching at the University of Houston since 1997. His disciplinary interests include ancient and early modern political philosophy and American political thought. Andy Little stands as the lead faculty member for The Honors College Study Abroad Program. Andy participated on the SURF faculty panel on applying to professional and graduate school.



SURF 2010 LECTURERS

Michelle Miley

Michelle Miley holds a B.A. in English and Psychology and an M.A. in English Literature from Baylor University. As the Assistant Director of Writing in the Disciplines at the University of Houston Writing Center, Michelle partners with professors across the university to teach writing within their courses. Her research interests include the use of small writing groups as a methodology for developing both better writing and better thinking. Michelle is currently working on her Ph.D. in Rhetoric, Composition and Pedagogy from the University of Houston. She has taught freshman and sophomore composition classes at Baylor University, Lubbock Christian University and Wayland Baptist University, and has coordinated and taught in the XL: Strategies for Learning program at Texas Tech University. This past summer, Michelle conducted a lecture for the SURF students on learning the language of their disciplines.



Anna P. Newman

Dr. Anna Newman is a geneticist who has studied protein secretion in the yeast *S. cerevisiae* and the development of the nematode *C. elegans*. In *C. elegans*, she discovered cell-cell interactions that occur during uterine development and characterized genes required for these processes. She performed her undergraduate studies at Harvard and received a Ph.D. in Cell Biology from Yale. She is the coauthor of over twenty research articles as well as of scientific review articles. Her work has been published in journals including *Nature*, *Genetics*, *Development*, and the *Journal of Cell Biology*.

She has taught and mentored students at the high school, undergraduate, and graduate levels. At the University of Houston, she teaches Introductory Biology and Genetics. She also organizes the Colloquium for Undergraduate Research in Biology, which provides students with a forum in which to present their research results. Dr. Newman participated on the SURF faculty panel on applying to professional and graduate school.



SURF 2010 LECTURERS

Daniel Price

Dr. Dan Price received his degree in Contemporary French and German Philosophy. He teaches seminars and studios for students working on their Senior Honors Thesis. A graduate of DePaul University, his second book is *Touching Difficulty: Sacred Form from Plato to Derrida*. A teacher with a wide-range of interests, Dr. Price recently taught a problem-based learning course called Asthmatic Spaces: Houston that incorporated research methodologies from several disciplines. Dr. Price conducted a lecture on his asthma research for the SURF participants.



Lisa Renaud

Lisa Renaud is a Career Counselor at the University Career Services office at the University of Houston. She provides career counseling to students in the Colleges of Natural Sciences & Mathematics, Pharmacy, and Optometry. She also assists students who are pursuing pre-professional training for healthcare careers.

She received her Bachelor of Science in Human Development from the University of Maine. She holds a Master's degree in Counseling from the University of Houston. She has over 4 years experience counseling and coaching students and alumni from both the University of Houston and Rice University, and is also a Licensed Professional Counselor. Lisa conducted a SURF lecture on developing an effective personal essay and also participated on the SURF faculty panel on applying to professional and graduate school.



SURF 2010 LECTURERS

Hanadi S. Rifai

Dr. Hanadi Rifai is a Professor in the Civil and Environmental Engineering Department at the University of Houston. Her expertise includes ground water flow and transport modeling, risk assessment, natural attenuation, hazardous waste, hydrology, urban storm water quality, non-point source pollution, Total Maximum Daily Loads, Decision Support Systems and Geographic Information Systems. In addition to authoring the widely-used BIOPLUME II, BIOPLUME III and BIOPLUME IV computer models for biodegradation and natural attenuation modeling, Dr. Rifai has built and manages the GIS (Geographical Information Systems) computer laboratory in the department. She also teaches professional courses on groundwater contaminant transport, remediation and groundwater modeling, natural attenuation, and risk assessment. Dr. Rifai conducted a lecture on pollutants in the Houston Ship Channel for the SURF participants.



Len Trombetta

Dr. Len Trombetta earned a B.S. in Physics from Rensselaer Polytechnic Institute in 1976, and a Ph.D. in Physics from Lehigh University in 1984. His Ph.D. dissertation was the result of research done at the Army Research Laboratory, Fort Monmouth, NJ, where he worked from 1981 until 1986. He joined the UH faculty in 1986 and is currently an Associate Professor. Dr. Trombetta enjoys teaching courses in electronics and solid state device physics. His research is on semiconductor device reliability, and of insulators used in the fabrication of semiconductor devices. This past summer, Dr. Trombetta participated on the faculty panel on applying to professional and graduate school.



PRESENTING UNDERGRADUATE RESEARCHERS

Comparing Attentional Strategies of Typically
Developing Children and Children with Autism
from the Child's Point of View

Student Researcher: Jaymie Allen

Faculty Mentor: Hanako Yoshida

Department: Psychology

Volumetric Histological Analysis of the Effects of VEG-F
and Adipose Stem Cells on Fat Growth in Rats

Student Researcher: Erik Alred

**Faculty Mentors: Kristin Campbell, M.D., Elisa-
beth Beahm, M.D., and Anshu Mathur, Ph.D.**

**Affiliations: Department of Chemistry, University of Houston and
Plastic Surgery Department, UT MD Anderson Cancer Center**

Examining Cone Density in Hyperopic Eyes

Student Researcher: Liz Amaro

Faculty Mentor: Jason Porter

Department: Optometry

Comparison of Projected and Actual Flight Trajectories
of Balloon Launched Scientific Instruments

Student Researcher: Darrell Anderson

Faculty Mentor: Barry Lefer

Department: Earth and Atmospheric Sciences

PRESENTING UNDERGRADUATE RESEARCHERS

Socially-Based Drinking Motives as Mediators
of the Relationship between Socially-Based Contingent
Self-Esteem and Drinking Among College Students

Student Researcher: Rosine Atidepe

Faculty Mentor: Clayton Neighbors

Department: Psychology

Derivation of the Beta-InMnO₃ Type of Structure by Doping

Student Researcher: Julie Burrell

Faculty Mentor: Angela Möller

Department: Chemistry

Galveston Emergency Management Center

Student Researcher: Sammy Butts

Faculty Mentor: Geoffrey Brune

Department: Architecture

The Function of ADAMTS18 in Mammary Gland Development

Student Researcher: Cecilia Cai

Faculty Mentors: Marian Caikovski and Cathrin Brisken

**Affiliations: The Swiss Institute for Experimental Cancer Research,
Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland**

PRESENTING UNDERGRADUATE RESEARCHERS

Reduction of Intermittency Through Interconnected Wind
Farms Along the Gulf Coast

Student Researcher: Zachariah Cavanaugh

Faculty Mentor: Ralph Metcalfe

Department: Mechanical Engineering

Internet-Based Intervention to Improve Dietary Habits in
Women of Color: Saving Lives Staying Active (SALSA)

Student Researcher: Jacqueline Dinh

Faculty Mentor: Rebecca Lee

Department: Health and Human Performance

Ceilometer Derived Boundary Layer Heights during CALNEX

Student Researcher: Natalie Ferrari

Faculty Mentor: Barry Lefer

Department: Earth and Atmospheric Sciences

“Pack and Deliver”

Student Researcher: Erica Fletcher

Faculty Mentor: Dan Price

Department: Anthropology, The Honors College

PRESENTING UNDERGRADUATE RESEARCHERS

Biaxial Blood Vessel Testing Device

Student Researchers: Vivek Ghosh and Luis Matzar

Faculty Mentor: John Eberth

Department: Engineering Technology

Self-Determination and Drinking Among College Students: Greek versus
Non-Greek Students

Student Researcher: Rubi Gonzales

Faculty Mentor: Clayton Neighbors

Department: Psychology

Punishment and Proportionality: Double Jeopardy with Criminal Rights
to Employment

Student Researcher: Iman Hammad

Faculty Mentor: Tamler Sommers

Department: Philosophy

PRESENTING UNDERGRADUATE RESEARCHERS

Understanding Fear and Anxiety Like Responses in *Drosophila*
Melanogaster Using Anxiogenic and Anxiolytic Stimuli

Student Researcher: Sara Khan

Faculty Mentor: Gregg Roman

Department: Biology and Biochemistry

Effect of Regular Exercise on Cognitive Impairment in Acute Sleep Deprivation

Student Researcher: Amber Levine

Faculty Mentor: Karim Alkadhi

Department: Pharmacological and Pharmaceutical Sciences

Melt Stagnation in Peridotites from the Godzilla Megamullion

Student Researcher: Matthew Loocke

Faculty Mentor: Jonathan Snow

Department: Earth and Atmospheric Sciences

Laue Analysis of PbTe Substrates Grown by Vertical
Bridgman and Modified Traveling Heater Methods

Student Researcher: Kelly Mader

Faculty Mentor: Rebecca Forrest

Department: Physics

PRESENTING UNDERGRADUATE RESEARCHERS

Formation of Drosophila Hox Ultrabithorax (Ubx) Rings Using
Polyvinyl Acetate Bubbles

Student Researchers: Trevor Miller and Jon-Davy Maurice Palmer

Faculty Mentor: Donna Pattison

Department: Biology and Biochemistry

What Does the University of Houston Taste Like?

Student Researchers: Toshia Miracle and Samantha Porter

Faculty Mentor: Jay Neal

Department: Hotel and Restaurant Management

Reflectance Measurement of Anti-Reflective Coating on
Solar Cell Materials

Student Researcher: Ima Moradi

Faculty Mentors: Andenet Alemu and Alexandre Freundlich

Affiliation: Center for Advanced Materials

Simulation of Human Aorta Mechanics

Student Researcher: Paul Nguyen

Faculty Mentor: John Eberth

Department: Engineering Technology

PRESENTING UNDERGRADUATE RESEARCHERS

Polymers for Tissue Engineered Constructs Used in Bioprinting

Student Researcher: Bassim Oshiba

Faculty Mentor: John Eberth

Department: Engineering Technology

Form and Light: A Study of Light in the Work of Alvar Aalto

Student Researcher: Natasha Ostaszewski

Faculty Mentor: Donna Kacmar

Department: Architecture

Desegregation and Marketing: Foley's Department Store
in Houston, Texas, 1958-1964

Student Researcher: Brittainy Perry

Faculty Mentor: Teresa Tomkins-Walsh

Department: Houston History Archives

Excess Backpack Loads: A Study of Gait

Student Researcher: Srinivas Pushpala

Faculty Mentor: Adam Thrasher

Department: Health and Human Performance

PRESENTING UNDERGRADUATE RESEARCHERS

Patterning and Optimization of Protein Scaffolds with Ultrabithorax,
a Transcription Factor of *Drosophila Melanogaster*

Student Researcher: Taha Salim

Faculty Mentor: Donna Pattison

Department: Biology and Biochemistry

Managing a Bilingual Workforce: Effective Communication
Strategies for Hospitality Managers

Student Researcher: Trishia Saulog

Faculty Mentors: Juan Madera, Mary Dawson, and Jay Neal

Department: Hotel and Restaurant Management

A Method for the Measurement of Oxygen Fugacity in Abyssal Peridotites

Student Researcher: Lillian Schaffer

Faculty Mentor: Jonathan Snow

Department: Earth and Atmospheric Sciences

Molecular Modeling of the ATP-synthase Motor F_0 Subunit
and Proton Translocation

Student Researcher: Megan Scoppa

Faculty Mentor: Margaret S. Cheung

Department: Physics

PRESENTING UNDERGRADUATE RESEARCHERS

Characteristics of Pediatric IBD in Texas

Student Researcher: Kristin Tang

Faculty Mentors: Kalpesh Thakkar, Carolyn Hines Thibideaux, George D. Ferry

Affiliations: Baylor College of Medicine, Texas Children's Hospital

Why Rankings are Important to UH

Student Researcher: Silvia Vera

Faculty Mentor: Maureen Croft

Affiliation: Office of Institutional Research

Evaluating "Reach" in the Health Is Power (HIP) Study

Student Researcher: Kristin Wolfe

Faculty Mentor: Rebecca Lee

Department: Health and Human Performance

Novel Stealth-Targeted Liposomes for Controlled Drug Delivery

Student Researcher: Rezwana Zahir

Faculty Mentor: Malavosklis Bikram

Department: Pharmacological and Pharmaceutical Sciences

ELET 4208/INDS 4500 SENIOR PROJECT CLASS

Fall 2010 Project Groups

CET Advisor: **Farrokh Attarzadeh**

ID Advisor: **EunSook Kwon**

Team 1: Saturation Controlled Oxygen Regulator

CET Students

Nicholas Zuchlewski

Kristopher Hokanson

Jerry Wayne Buckner II

Jose Martinez Jr

ID Students

Jared Thorn

Mariel Pina

Chukwunonso Ofili

Team 7: Contego Security Bag

CET Students

Bryan David Hill

Ryan Gill

Adil Arif Darwesh

Richard Wong

ID Students

Rachel Young

Alexandros Kinalidis

Alfonso Villafuerte

Team 8: Smart ePants - Advanced Diaper Monitoring System

CET Students

Jessie Streater

Christine Luong

Daniel Tudder II

Oscar Rodriguez

ID Students

Addie Ballentine

Leo Chen

John Brown

Erica Pena

Team 9: Automobile Smart Glass Control System

CET Students

Thanh Nguyen

Hasan Yasin

Joel Mundt

ID Students

Shih-Jung Liu

Wyatt Little

Franklin Martin

THESIS STUDENTS 2009-2010

Taylor Alvis

Art History
Thesis Director: Luisa Orto

Ronald Ammon

Architecture
Thesis Director: Geoffrey Brune

Maria Arredondo

Psychology
Thesis Director: Hanako Yoshida

Blair Ault

History
Thesis Director: Charles Orson Cook

Gregory Bohuslav

Biomedical Engineering
Thesis Director: Adam Capitano

Kevin Darby

Psychology
Thesis Director: Hanako Yoshida

Caitlin Deans

English
Thesis Director: William Monroe

Janet DeLuna

Classics
Thesis Director: Francesca Behr

Mark Ellis

English
Thesis Director: William Monroe

Sarah Gabler

English
Thesis Director: William Monroe

Portia Gant

Theatre
Thesis Director: Robert Shimko

Alejandra Gomez

Communication Disorders
Thesis Director: Ferenc Bunta

David Gonzales

English
Thesis Director: Aaron Reynolds

Derek Goodwin

History
Thesis Director: Charles Orson Cook

Angela Grasso

Music Performance
Thesis Director: Andrew Davis

Katelyn Halpern

Honors
Thesis Director: John Harvey

Corey Henderson

Physics
Thesis Director: E.A. Bering

Kyle Hodges

English
Thesis Director: Martha Serpas

Justina Isidienu

English
Thesis Director: Nick Flynn

Caitlin Johnson

English
Thesis Director: Nick Flynn

Mireille Kameni

Architecture
Thesis Director: Geoffrey Brune

Andrew Khoury

Electrical and Computer Engineering
Thesis Director: M. Amin Kayali

Matthew Kolodoski

Political Science
Thesis Director: Ronald Vardy

Natascha Lachner

Psychology
Thesis Directors: Merrill Hiscock

Emily Lacy

Philosophy
Thesis Director: Cynthia Freeland

Max Lingamfelter

Mechanical Engineering
Thesis Director: Ralph Metcalfe

Annie Longley

History
Thesis Director: Catherine Patterson

Christine Maurer

English
Thesis Director: Nick Flynn

Shawnacy McAurthur

English
Thesis Director: James Kastely

Rafael Morales

Architecture
Thesis Director: Geoffrey Brune

Rouba Najjar

Biology
Thesis Director: Donna Pattison

Houng Nguyen

Architecture
Thesis Director: Geoffrey Brune

Maria Oran

Architecture
Thesis Director: Geoffrey Brune

Michael Osborne

English
Thesis Director: Ann Christensen

Shyam Panchal

Pharmacy
Thesis Director: Joydip Das

Sarah Panjwani

Communication Disorders
Thesis Director: Martha Dunkleberger

Amanda Pate

English
Thesis Director: Aaron Reynolds

Athena Patira

Architecture
Thesis Director: Geoffrey Brune

(continued on page 44)

THESIS STUDENTS 2009-2010

Heather Pedoto

Honors
Thesis Director: John Harvey

John Phillips

Honors
Thesis Director: John Harvey

Cynthia Plascencia

English
Thesis Director: James Kastely

Maria Pulsifer

Education
Thesis Director: Sabrina Marsh

Srinivas Pushpala

Health and Human Performance
Thesis Director: Adam Thrasher

Arthar Razvi

Mechanical Engineering
Thesis Director: Gangbing Song

Godfrey Rodrigues

Health and Human Performance
Thesis Director: Joel Bloom

Carlos Rueda

Chemical Engineering
Thesis Director: Manolis Doxastakis

Andrea Schlather

Chemistry
Thesis Director: Rigoberto Advincula

Daniel Sellers

History
Thesis Director: James Martin

Jonathan Shelledy

Architecture
Thesis Director: Geoffrey Brune

Rita Sirrieh

Biochemistry
Thesis Director: Cecilia Williams

Angela So

English
Thesis Director: Dudley Reynolds

Eric Stout

Mechanical Engineering
Thesis Director: Fazole Hussain

Samantha Thorpe

English
Thesis Director: William Monroe

Westley Trevino

Economics
Thesis Director: Scott Imberman

Ronnie Turner

History
Thesis Director: Orson Charles Cook

Jyothis Varghese

Psychology
Thesis Director: Mary Naus

Petrus Wassdorf

Political Science
Thesis Director: Richard Murray

Christine Wisch

Music
Thesis Director: Paul Bertagnolli

Abdul Zakaria

Economics
Thesis Director: Ruxandra Prodan

Sanja Zillic

Architecture
Thesis Director: Geoffrey Brune



PURS FALL 2010

Acuna, Marianela

Sociology

Faculty Mentor: Anthony Dworkin

Burrell, Julie

Chemistry

Faculty Mentor: Angela Moeller

Caballero, William

Industrial Engineering

Faculty Mentor: Omer Kundakcioglu

Chan, Calvin

Mechanical Engineering

Faculty Mentor: Gangbing Song

Chung, Ji

Pharmacy

Faculty Mentor: Svetlana Tikunova

Curto, Chelsea

English

Faculty Mentor: Lorraine Stock

Dinh, Thanh-Thao

Chemical Engineering

Faculty Mentor: Gila Stein

Dukes, Jeannette

Biology

Faculty Mentor: Masaya Fujita

Galvan, Edlin

Educational Psychology

Faculty Mentor: Allison Dempsey

Hedt, Corbin

Health and Human Performance

Faculty Mentor: William Paloski

Hernandez, Marla

Educational Psychology

Faculty Mentor: John Gaa

King, Chelby

Art History

Faculty Mentor: Sandra Zalman

Lovings, Lauren

Art History

Faculty Mentor: Rex Koontz

Lynch, Meredith

Psychology

Faculty Mentor: Christanne Spitzmeuller

Maldonado, Miguel

Chemical Engineering

Faculty Mentor: Jeffrey Rimer

Markovitch, Thomas

Physics

Faculty Mentor: Donald Kouri

Moayedi-Azarpour, Yasmine

Pharmacy

Faculty Mentor: Ke-He Ruan

Montes, Lydia

Health and Human Performance

Faculty Mentor: Thomas Lowder

Noh, Hana

Biology

Faculty Mentor: Timothy Cooper

Phu, Edward

Mathematics

Faculty Mentor: Josic Kresimir

Rahbar, Siavash

Biology

Faculty Mentor: Yuhong Wang

Rucker, Reagon

Dance

Faculty Mentor: Rebecca Valls

Shah, Archana

Biology

Faculty Mentor: James Briggs

Stanley, Chelsea

Theatre

Faculty Mentor: Robert Shimko

Stoy, Taylor

Hotel and Restaurant Management

Faculty Mentor: Jay Neal

Thor, Tiffany

English

Faculty Mentor: Lynn Voskuil

Timmons, Patrick

Chemistry

Faculty Mentor: Jeremy May

Valencia, Jacinda

Mechanical Engineering

Faculty Mentor: Gangbing Song

Vo, Christina

Biology

Faculty Sponsor: Brigitte Dauwalder

Vu, Anthony

Pharmacy

Faculty Sponsor: Samina Salim

PURS SPRING 2010

Agatha Agbanobi

English

Faculty Mentor: Irving Rothman

Michael Agholor

Pharmacy

Faculty Mentor: Romi Ghose

Jaymie Allen

Psychology

Faculty Mentor: Hanako Yoshida

Ian Bailey

Electrical and Computer Engineering

Faculty Mentor: David Jackson

Amber Baysinger

Psychology

Faculty Mentor: Adriana Alcantara

Audrey Cheong

Electrical and Computer Engineering

Faculty Mentor: Paul Ruchhoeft

William Choi

Mechanical Engineering

Faculty Mentor: Gangbing Song

Miriam Dalaei

Business

Faculty Mentor: Rosalind Wyatt

Matt Dickenson

Political Science

Faculty Mentor: Ryan Kennedy

Erica Fauser

History

Faculty Mentor: Charles Orson Cook

Anna Sophia Fields

History

Faculty Mentor: Kairn Klieman

Erica Fletcher

Anthropology

Faculty Mentor: Janice Hutchinson

Sylvia Garcia

English

Faculty Mentor: Paul Guajardo

Depinder Gill

Health and Human Performance

Faculty Mentor: Jian Liu

Michael Glaze

Engineering Technology

Faculty Mentor: Fatima Merchant

Carrie Gonzales

Architecture

Faculty Mentor: Leonard Bachman

Levi Herman

Psychology

Faculty Mentor: Carla Sharp

Daniel Jarvis

Hotel and Restaurant Management

Faculty Mentor: Mary Dawson

Chiao Kang

Chemistry

Faculty Mentor: Jeremy May

Tommy Kirk

Hotel and Restaurant Management

Faculty Mentor: Jay Neal

Cindy Ly

Biology

Faculty Mentor: Yuhong Wang

Shobha Mathew

Health and Human Performance

Faculty Mentor: Adam Thrasher

Lindsay O'Dell

Education

Faculty Mentor: Elizabeth Kirk

Marian Ochoa

Art

Faculty Mentor: Stephan Hillerbrand

Natasha Ostaszewski

Architecture

Faculty Mentor: Donna Kacmar

Yuli Pan

Pharmacy

Faculty Mentor: Malavosklish Bikram

Jasmine Patel

Health and Human Performance

Faculty Mentor: Charles Layne

Jose Perez

Philosophy

Faculty Mentor: Tamler Sommers

Trang Pham

Chemical Engineering

Faculty Mentor: Gila Stein

Amir Pirzadeh

Pharmacy

Faculty Mentor: Ke-He Ruan

Matthew Reichl

Physics

Faculty Mentor: Kevin Bassler

William Rifenburgh

Mechanical Engineering

Faculty Mentor: Karolos Grigoriadis

Yevgeniy Shevchenko

Biology

Faculty Mentor: Timothy Cooper

Sameer Siddiqi

Health and Human Performance

Faculty Mentor: Rebecca Lee

Nicole Sopko

Hotel and Restaurant Management

Faculty Mentor: Stowe Shoemaker

Thai Vu

Chemical Engineering

Faculty Mentor: Gila Stein

Ashkan Zand

Biology

Faculty Mentor: Ricardo Azevedo

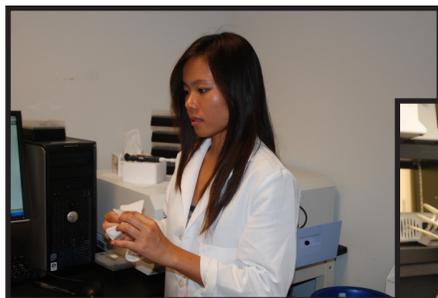
HOW TO GET STARTED CONDUCTING RESEARCH

All of the programs offered by the Office of Undergraduate Research require that students secure a faculty member with whom they would like to conduct research with before applying to one of the programs. This leads many students wondering how they should initiate the process.

Here are a few tips on how to secure a research opportunity at UH:

- Talk to current and past professors (during their office hours) from courses you have excelled in and have enjoyed. Even if the professor is not currently seeking an undergraduate researcher, he or she may know of a colleague that is seeking an undergraduate research assistant.
- Consult an academic advisor from your department to inquire about faculty members currently conducting research in your discipline.
- Check the web page of faculty members currently seeking undergraduate researchers for ongoing projects, www.undergraduateresearch.uh.edu/facultyresearch.html. Also peruse your department's website to find out about the research the faculty within your discipline are conducting.
- Join the Office of Undergraduate Research's **Facebook** fan page. You will receive weekly updates on available research positions and scholarships for undergraduates.
- Join **HURN**, the student organization for undergraduate research. This will allow you to connect and network with other UH undergraduate researchers.

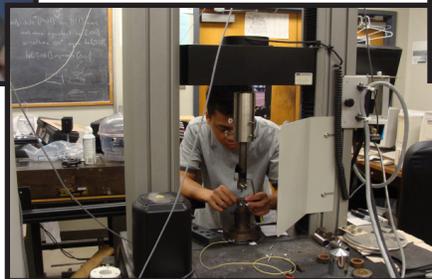
The Provost's Undergraduate Research Scholarship (PURS) is a research program offering junior and senior students \$1,000 scholarships to conduct research projects during the fall and spring semesters. This scholarship is open to students from all colleges and disciplines. Candidates must have at least a 3.0 grade point average to apply. For more information and to view the online application, visit the PURS website at www.undergraduateresearch.uh.edu/purs.html.



The Summer Undergraduate Research Fellowship (SURF) program is a full-time, 10-week summer research program, open to all continuing students, that provides a \$3500 stipend to conduct research under the mentorship of a UH faculty member. The projects run the gamut from analyzing texts in the library, to conducting fieldwork, to experimenting with specimens in laboratories. Students from all disciplines are encouraged to apply. The deadline for SURF is in the middle of March each year. For more information and to view the online application, visit the SURF website at www.undergraduateresearch.uh.edu/surf.html.

The Senior Honors Thesis is a capstone program that serves as the pinnacle of the student's undergraduate career in research. Student participants enroll in 3399H and 4399H, a total of six hours of coursework, which is typically applied toward their major degree requirements in their senior year. Before the start of the semester, the student secures a thesis director that serves as the instructor of record and mentor of the project. A second reader and Honors reader also serve on the student's thesis committee, offering advice during the research and writing process as well as at the student's defense of the thesis.

Many students cite the thesis project as the highlight of their experience as an undergraduate. For more information, please visit the thesis website at www.undergraduateresearch.uh.edu/thesis_guidelines.htm.



NATIONALLY COMPETITIVE SCHOLARSHIPS

The Honors College and The Office of Undergraduate Research assist students in finding and applying for nationally competitive scholarships. Nationally competitive scholarships are awards that require university endorsement to apply. Contact Karen Weber at kweber@uh.edu or at 713-743-3367 for more information. A more detailed listing of competitive awards can be found at www.undergraduateresearch.uh.edu. Among these scholarships are the following:

RHODES SCHOLARSHIPS

The Rhodes Trust awards 32 scholarships each year to American students for study at Oxford for 2-3 years. The Rhodes Scholarship covers tuition and all other educational costs for the scholars' tenure at Oxford. Applicants must be full-time graduating seniors that have at least a 3.75 GPA, demonstrate strong leadership abilities, and possess a strong sense of social purpose. Candidates should also be U.S. citizens, unmarried, under the age of 24, and have attained a bachelor's degree before beginning their first term at Oxford. The deadline is in the beginning of October each year, but interested candidates should contact Karen Weber no later than the end of the spring semester of their junior year.

MARSHALL SCHOLARSHIPS

The Marshall Foundation offers 40 awards each year for one or two years of study at any university in the United Kingdom. The Marshall Scholarship covers tuition, cost of living expenses, travel expenses, and other academic fees. Candidates should be graduating seniors with at least a 3.75 GPA, U.S. citizens, demonstrate strong leadership abilities and a commitment to public service, and have a clear rationale for studying in the United Kingdom. The deadline is in the beginning of October of each year, but interested candidates should contact Karen Weber no later than the end of the spring semester of their junior year.

ROTARY AMBASSADORIAL SCHOLARSHIPS

The Rotary Ambassadorial Scholarship awards \$13,000-\$25,000 to fund at least one year of a study abroad program and the costs associated with the program. The purpose of the scholarship is to further international understanding and friendly relations among people of different countries. The deadline is over a year before the period of study would begin. All applicants must be citizens of a country in which there are Rotary clubs. The deadline for the Rotary Ambassadorial Scholarship is at the beginning of February each year.

GOLDWATER SCHOLARSHIPS

The Barry Goldwater scholarship funds up to \$7,500 each year to sophomores and juniors interested in pursuing a research career in math, science or engineering. Candidates must have at least a 3.8 GPA, be U.S. citizens or permanent residents, and have demonstrated research experience. The national deadline is at the end of January each year, but the campus deadline is in November.

FULBRIGHT GRANTS AND TEACHING ASSISTANTSHIPS

The Fulbright funds all expenses for a one-year research grant or graduate study in over 140 countries. Fulbright teaching assistantships are also available in a variety of different regions. Candidates must be U.S. citizens and have a bachelor's degree by the time they begin their project overseas. The Fulbright deadline is in the middle of October each year, but the campus deadline is typically about a month before the national deadline.

UH LEARNING THROUGH DISCOVERY

Transforming the Undergraduate Experience through Research

The *Learning through Discovery Initiative* is the University of Houston's comprehensive Quality Enhancement Plan (QEP). The five-year initiative promotes a teaching and learning culture supportive of research in all disciplines for all undergraduate students. The initiative focuses on 1) providing research skills training and 2) expanding student research opportunities both on and off campus. Research skills and experience will equip our talented and diverse students with the valuable tools they need to compete in the global marketplace or as they pursue graduate studies.



Photo by Lacy/Shea (UH)

Discovery Resources and Programs

Students will benefit from a host of new programs and resources such as:

- Discovery Workshops & Tutorials – introductory research skills training via in-person workshops or online tutorials
- eDISCOVER – an online portal connecting students to research opportunities and mentors
- Reality Chats – in person and online chats with alumni and mentors about their career paths and research experiences in industry, academia, etc.
- Research Dissemination - support for student showcases in departments and colleges, prizes for Undergraduate Research Day, the Posters on the Hill Travel Award, and Undergraduate Research Travel Fellowships for student research presentations at national conferences
- Research-Supportive Curriculum – a QEP Curriculum Development Grant Program provides support for enhancements to existing courses or development of new courses that incorporate inquiry-based learning or research training

For more information and to see how you can become involved, please visit www.uh.edu/discovery.

THE HONORS COLLEGE

The Honors College Philosophy

The Honors College at the University of Houston serves the intellectual needs of gifted undergraduates in more than 100 fields of study. We provide the careful guidance, flexibility, and personal instruction that nurture excellence. For the students who join us each fall, we offer the community and advantages of a small college together with the resources and rich diversity of a large university. Our faculty and staff believe that a university education should offer more than the acquisition of skills for the workplace. The Honors College challenges the University's finest students to develop the attributes of mind and character that enhance all facets of life.

The Honors College Community

Special Classes and Course Selection

We draw on the talents of the finest faculty members within the University to provide a wide range of special courses with limited enrollment. Honors courses encourage student participation, interaction, and discussion.

Membership in a Community

You will enjoy special privileges, including The Honors College scholarships, priority registration, computer facilities, reserved lounge and study areas, study abroad opportunities, and special housing in The Honors College residence halls. Many intangible benefits also come with participation in the Honors community—the friendships that develop in the classroom carry over into other areas of student life. We foster an atmosphere of collegiality and a spirit of camaraderie through informal gatherings, social activities, and on- and off-campus cultural events.

Talented Classmates

When admitted to The Honors College, you will enter the company of the most academically talented undergraduates at the university. Members bring a variety of interests, aptitudes, and ambitions to their studies. Through daily association with other Honors students, you will discover the broad range of academic programs at the University.

Honors Curriculum

Our curriculum is designed to coordinate with all majors/degree plans offered at the University of Houston's core. You will fulfill many of your university core requirements through Honors courses that take the place of regular required classes. One key sequence of courses, The Human Situation, is team-taught by Honors faculty and is designed to ensure that you are introduced to the great books of the Western tradition. For many Honors students, the Senior Honors Thesis represents the exciting culmination of a bachelor's degree. A thesis provides an excellent opportunity for you to work under the direction of faculty in your chosen field of study, applying your skills and knowledge toward the completion of a scholarly or creative project.



PHRONESIS: A PROGRAM IN POLITICS AND ETHICS

“What is justice?”

“What is justice?” asked Socrates, the self-described “gadfly” of ancient Athens. For centuries, great thinkers from Plato and Aristotle to Machiavelli and Nietzsche have addressed such fundamental questions as the nature of war and peace, the relation between freedom and authority, and the origins of moral and political order. Reflecting on our own American experience, writers and political actors such as Jefferson, Hamilton, and Madison call us to consider the character of democracy, the grounds of liberal constitutionalism and the problems and promise of a free society. In the long course of intellectual history, these and other thinkers have taken up the issues of gender, the family, religion, commerce, and science, and, like the gadfly of Athens, urged us to reflect on the fundamental question of the human good.



Questions such as these are the focus of a program in Politics and Ethics established by the Honors College in collaboration with the College of Liberal Arts and Social Sciences. The program’s name, *Phronesis*, is the Greek word for prudence or practical wisdom, the quality that distinguishes good citizens and political leaders.

Students who participate in *Phronesis* are a part of a vibrant intellectual community engaged with some of the most profound and enduring questions of human life as well as central and current topics in politics and ethics. The program is housed in the Honors College as an interdisciplinary minor, established with the cooperation of faculty in Political Science, Philosophy, and Classical Studies. The curriculum draws on the foundation provided by “The Human Situation,” the year-long intellectual history course required of all Honors freshmen. Students of any major can then choose from a variety of courses in political theory, philosophy, and classics. Representative offerings include “Liberalism and its Critics,” “Law, Society, and Morality,” “History of Ancient Philosophy,” “The Roman Republic,” and “Recent Islamic Political Thought.” In addition to course offerings that draw on the expertise of faculty across disciplinary boundaries, *Phronesis* also hosts public events that engage the wider University and community.



Contact Information:

Susan Collins, Director suecoll724@uh.edu

Christine LeVeaux-Haley, Interim Assistant Dean for Academic Programs and Coordinator clsharpe@uh.edu

Andy Little, Advisor alittle@uh.edu

MEDICINE & SOCIETY

The Medicine & Society Program

Houston is a city in which health care is an industry of immense importance historically, economically and culturally. The Texas Medical Center is the largest in the world and home to two medical schools, two schools of nursing, and a score of programs in the allied health sciences, as well as a dozen major hospitals, clinics, research laboratories, and other medical facilities. Despite this prestigious center and others within the state, Texas residents are underserved in the realm of public health. Many have little access to affordable health care, relying on frequently overburdened emergency services for their most basic medical needs. Other Texas residents that do have access find the system difficult to navigate, or even alienating in its lack of meaningful human interaction. What Texas shares with the rest of the United States is a health care system that is at one and the same time the best in the world and also fraught with problems for so many of its consumers.

Founded in 1941, the Texas Medical Center has grown to be amongst the largest in the world. It is now home to two medical schools, two schools of nursing, and a score of programs in the allied health sciences, as well more than a dozen major hospitals, clinics, research laboratories, and other medical facilities. With its on-site faculty expertise and its close ties to the Methodist Hospital and other institutions in the medical center, The Medicine & Society Program (est. 2005) is ideally positioned to coordinate and lead major educational projects, including academic courses, public lectures, conferences, and research collaborations directed toward greater understanding of the relationship between medicine and wider society.

If you are a student or member of the public interested in more information about this Program please contact Helen Valier, Coordinator of The Medicine & Society Program at 713-743-9021, or by email hkvalier@uh.edu. We also welcome inquiries from organizations and groups wishing to collaborate with our members. For more information, please visit uh.edu/honors/honors-minors-programs/medicine-society-program/.



Contact Information:

William Monroe, Dean of The Honors College & Director: wmonroe@uh.edu

Helen Valier, Coordinator: hkvalier@uh.edu

Andy Little, Peoplesoft Coordinator & Academic Advisor: alittle@uh.edu

CENTER FOR CREATIVE WORK

The Center for Creative Work offers courses and programs for students interested in a critical and interdisciplinary arts environment. We provide workshops, directed studies, retreats, and signature events such as the *Dionysia* that bring together great books and creative minds.

The Center offers a Creative Work Minor that provides a multidisciplinary art-in-context program integrating creative projects, critical study, and cultural research. Beginning with the foundation course, “Poetics and Performance,” students explore creative work through the study of art, film, literature, theatre, and music in the context of culture, history, language, business, and society. The minor integrates co-curricular activities both on- and off-campus.

Partnership with various departments, disciplines, and programs is at the very heart of the Creative Work Minor. Courses in the minor include “Philosophy of Art,” “Politics, Film, and Literature,” and “Documenting the Culture of Houston.” Another course, “Artists and Their Regions,” affords students an opportunity to pursue art, dance, drama, fiction, music, videography, and poetry while reading and studying artists and authors in the geographical locale associated with their work. The class also travels to selected areas in and out of state for weeklong retreats to focus on individual creative projects and meet with other students and faculty in workshops.

The Center also unites academic study with artistic experience, both as a performer and as a spectator. During the spring, the traditional time of the *Dionysia* festival in ancient Athens, the Center for Creative Work produces and performs a newly-translated Greek tragedy or comedy. The Honors & The Arts program also creates opportunities for students to attend exhibitions, performances, readings, and film screenings throughout Houston by collaborating with organizations such as Inprint, the Cynthia Woods Mitchell Center for the Arts, The Menil Collection, and The Museum of Fine Arts Houston Film Series. Finally, many students pursuing the minor in Creative Work make the Senior Honors Thesis the culminating experience of their undergraduate careers. Particularly for those who aspire to continue their studies in graduate school, the thesis allows them to further the work that has been most exciting and rewarding. A thesis may be creative, performative, or critical, and students work closely with a faculty mentor throughout the process.



Contact Information: John Harvey, Director, jrharvey@mail.uh.edu

SURF 2010 STUDENTS IN ACTION



Join the Office of Undergraduate Research's Facebook Page



Receive information regarding:

- research opportunities
- scholarships for research, undergraduate and graduate studies
- internships
- study abroad fellowships
- events on and off campus

Follow on Facebook: 

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<http://www.flickr.com/photos/uhrresearch/>



SAVE THE DATE!



PURS Spring 2011 Application Deadline:
November 19, 2010

SURF 2011 Application Deadline:
March 25, 2011

Faculty Mentoring Award Nomination Deadline:
February 7, 2011

UNIVERSITY of **HOUSTON**

OFFICE OF UNDERGRADUATE RESEARCH

University of Houston
The Honors College
University of Houston
Office of Undergraduate Research
212 MD Anderson Library
Houston, TX 77204-2001

Office telephone: 713/743-3367
Office fax: 713/743-9015
www.undergraduateresearch.uh.edu

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