

FARQUHAR COLLEGE OF ARTS AND SCIENCES

# 13<sup>th</sup> Annual Undergraduate Student Symposium



# Undergraduate Student Symposium

**Friday, April 4, 2014**

Alvin Sherman Library, Research, and Information Technology Center

## Undergraduate Student Symposium 2014

The Undergraduate Student Symposium, sponsored by the Farquhar College of Arts and Sciences, presents student projects through presentations, papers, and poster displays. The event serves as a “showcase” demonstrating the outstanding scholarship of undergraduate students at NSU. The Symposium is open to undergraduate students from all disciplines. Projects cover areas of student scholarship ranging from the experimental and the applied to the computational, theoretical, artistic, and literary. They are taken from class assignments as well as from independent projects. The projects do not have to be complete; presentations can represent any stage in the concept’s evolution, from proposal and literature review to fully completed and realized scholarly work. As in past symposia, the definition of scholarship will be sufficiently broad to include work presented in the biological and physical sciences, the social and behavioral sciences, computer science, mathematics, arts and humanities, education, and business. This is the thirteenth annual Undergraduate Student Symposium.

### USS 2014 Keynote Speaker

**Jonathan B. Banks** is an assistant professor of psychology in the Division of Social and Behavioral Sciences at Nova Southeastern University in Ft. Lauderdale. He graduated from the University of North Texas with a Ph.D. in Experimental Psychology and from North Carolina State University with a M.S. in Psychology, with a concentration in Developmental Psychology, and a B.A. in Psychology. His research focuses on working memory, control of attention, and the impact of stress on cognitive functioning. Jonathan has an active lab that includes undergraduate and master’s students. His work has been published in a variety of academic journals, including *Cognition and Emotion*, *Journal of Affective Disorders*, *Biological Psychology*, *Aging and Mental Health*, *Psychology and Health*, and the *International Journal of Affective Disorders*.

### USS 2014 Organizing Committee

Dr. Don Rosenblum, Dr. Michael Caldwell, Dr. Tom Fagan, Dr. Matthew He, Dr. Marlisa Santos, Vanessa Mezquia, Jeanne Hamacher, Brandon Bielich

**13<sup>th</sup> Annual  
Undergraduate Student Symposium**

**April 4, 2014**

**Abstract Proceedings**

**Farquhar College of Arts and Sciences  
Nova Southeastern University**



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## **A Case Report of Improving Running Biomechanics through Movement Pattern Training in a Female Competitive Runner**

**Anya Ellerbroek and Stephanie Hauck**  
Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Monique Mokha**

### **Abstract**

Running-related musculoskeletal injuries occur with an overall yearly incidence rate between 37 and 65%. Most are lower extremity with 50-75% of all running injuries classified as overuse. These injuries have been linked to faulty running biomechanics such as foot over pronation, and excessive hip adduction and internal rotation. Therapists have primarily focused on strengthening the hip muscles to prevent excessive motion. However, little evidence supports the efficacy. This case outlines the use of functional movement pattern training rather than isolated muscle training to improve faulty biomechanics. The participant was a 19 year old female competitive distance runner with a history of right knee iliotibial band pathology who underwent a 4-week exercise program aimed at correcting movement patterns. Pre- and post-measures included Functional Movement Screen™ (FMS) scores and data from three-dimensional motion capture of her running biomechanics. Results showed improved FMS scores from 15/21 to 17/21 and eliminated left to right asymmetries. Biomechanically, she reduced her hip internal rotation from  $35.5^{\circ}$  to  $25.7^{\circ}$ , and her impact force from 301.7 N to 286 N. These reductions are considered positive toward correcting faulty mechanics. However, there were small but noteworthy increases in foot pronation,  $7.2^{\circ}$  to  $8.1^{\circ}$ , and pelvis drop,  $1.6^{\circ}$ , to  $4.9^{\circ}$ . Hip adduction increased by 0.5 degrees, not clinically meaningful. Moreover, she remained injury-free. We conclude that movement pattern training rather than isolated muscle training had a positive effect on correcting FMS scores and two faulty biomechanics measures. A greater training period may be necessary to impact all faulty mechanics.

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## **A High School Football Dream**

**Hannah Aldoroty**  
Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“A High School Football Dream” is a short film about a young man who was an awesome football player in high school. He was scouted by a few top-ranked colleges around the country, but decided to wait to hear back from the school he really wanted to play for. Unfortunately, that school never contacted him; by the time he realized what had happened, the other top-ranked schools had given up on him and recruited other players. Now he plays for a school that is not highly ranked in college football. In the film, he discusses how it feels to miss out on a chance to play for a top-ranked college team (as is the case for so many other young men who go through similar situations in high school). This film is directed by Hannah Aldoroty. Other crew members and actors include Griffin Goins, Cindy Going, Reese Going, and Garret Going.

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## **A P450 Metabolism Experiment for Undergraduate Biochemistry Laboratories**

**Catherine Chiafair**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Dimitri Giarikos and Dr. Reza Razeghifard**

### **Abstract**

A laboratory experiment is described to provide students hands-on experience in learning some aspects of microsomal P450-catalyzed metabolism. Undergraduate students in the biochemistry laboratories detect and quantify the metabolites produced from butylated hydroxytoluene by liver microsomes using Gas Chromatography-Mass Spectrometry (GC-MS) techniques. The laboratory provides training to students for handling active microsomes, sample cleanup of biological matrices, extraction of organic metabolites, GC-MS analysis and data interpretation of complex mixtures, and collaborative work.

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## **A Survey of the Cost-Benefit Analyses of Uninsurance**

**Prasanna Marathe**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Charles Harrington**

H. Wayne Huizenga School of Business and Entrepreneurship

### **Abstract**

Health care spending is carving up an increasing share of the US national gross domestic product—approximately 18%—but the absolute number—46 million— and the proportion of uninsured Americans—15%— are also on the rise (McConnell, *Microeconomics: Principles, Problems, and Policies*, 2012). These counterintuitive trends are alarming and cannot be sustained without significant net economic costs. A survey of the cost-benefit analyses of uninsurance reveals that uninsurance has tremendous opportunity costs (ex: foregone economic productivity and higher mortality) and is economically (net) harmful. It also reveals that extending insurance to currently uninsured will be economically (net) beneficial to our nation as a whole because of its effects on the real GDP. Even though this study primarily aims to characterize uninsurance using cost-benefit analysis, it also provides supporting evidence (in the concluding sections) for why insurance should be extended through private (free market-based), rather than government, mediums.

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## **A Web Interface for Visual Galaxy Classification**

**Chau Phung**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Stefan Kautsch and Dr. Michael Van Hilst**

### **Abstract**

Galaxies can have a variety of shapes. These morphologies range from disk-dominated to elliptical and irregular appearances. Understanding galaxy morphology is crucial in order to address questions concerning the evolution and formation of galaxies and their dark matter content. However, determining galaxy morphology is a difficult task. While galaxies can be classified using automatic algorithms, the human classification by eye is more sensitive to fine structures such as spiral arms and galaxy interaction features. Unfortunately, galaxy catalogs are very big, making it a time consuming process to classify thousands of galaxies. In order to expedite this process, we developed a galaxy classification web-interface.

The interface allows human users to categorize galaxies into various fundamental types. The website is designed with HTML5, JavaScript, PHP, and a MySQL database. The users can create an account, then login and complete a survey of the galaxy types. Meanwhile, the administrator can modify the images being surveyed, view the account list, and view the distribution of collected answers. More advanced capabilities will be added to the system as the development continues.

This web-page is designed to be used in the classroom with students, such as NSU's Introduction to Astronomy courses, providing students hands-on research experience and training, and allows them to contribute to studies of galaxy morphology.

## **An Exclusive Look at Cordell Aikman**

**Tania Aikman**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“An Exclusive Look at Cordell Aikman” is a short documentary film about a brilliant girl (Cordell Aikman) who can do anything she puts her mind to, including gymnastics and acting. She is already an actress with a very impressive resume at the age of 7. The film is directed by Tania Aikman. Other crew members include Ashley Fletcher, Sharon Copeland, and Yesenia Reyes.



## **An Incompatible Romance**

**Grace Ducanis**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Suzanne Ferriss**

### **Abstract**

This presentation examines the heroine and hero of Jane Austen's novel *Northanger Abbey*, exposing their inequality in temperament, intelligence, and discernment, while questioning the true motivations for their attachment. Catherine Morland and Henry Tilney are not separated by wealth, class, or other social expectations, but by their critically dissimilar personalities. Although Catherine is inferior to Tilney in every sense, the novel promotes the couple's romance and marriage. Tilney's affection does not stem from his acceptance of Catherine as an equal, but from his perception of her affection for him. This paper explores the polarity of the two characters in light of the outmoded idea that love is not contingent on compatibility but on commitment and strength of will.

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## **Analysis by GCMS of Flavone Isomers in Pancreatic Cancer Cells**

**Daniela Fernandez**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Maria Ballester**

### **Abstract**

Flavone A and B were found to be cytotoxic in pancreatic and colon cancers. Both work in triggering cell apoptosis, although the mechanism and relationship between structure and function are unknown. They are similar in structure, only differing in the location of a hydroxyl and methoxyl group. Flavone B is more planar and lipophilic and, in contrast to Flavone A, has been found to selectively induce apoptosis in less differentiated cancer cells. In this study, the goal was to trace flavone uptake by pancreatic cancer cells and its dispersion inside to determine whether apoptosis is caused in the nucleus or cytoplasm. Two pancreatic cancer cell types were used, PANC28 and MiaPaca, of which PANC28 is more differentiated. It is known that the cytotoxic effects are limited to Flavone A in PANC28 and Flavone B in MiaPaca. Samples of both cell types were dosed with a 40  $\mu$ M concentration of Flavone A and B in separate trials with exposure times of 1, 10, and 30 minutes with different oexposure times for the cytoplasmic and nuclear fractions obtained through their separation. The fractions were analyzed using GCMS with a Rxi-5ms column. Flavone A appeared in both nuclear and cytoplasmic fractions of Panc28 and MiaPaca. Flavone B appeared only in the nuclear fraction of Panc28 and the cytoplasmic fraction of MiaPaca. This suggests that Flavone A localizes in cytoplasm but interacts with nuclear components to trigger apoptosis, while Flavone B induces death of the MiaPaca cancer cells from its location in the cytoplasm.

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**Analyzing the Short-term and Long-term Learning Outcomes on State and National Assessments  
of Traditional Public High Schools and Charter High Schools in the State of Florida**

**Marissa Hoffman**

Abraham S. Fischler School of Education  
Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Jason Gershman, Dr. Sandra Trotman, and Dr. Patrice Leblanc**

**Abstract**

The purpose of this research was to determine the short-term and long-term learning outcomes of students who attended traditional public high schools versus charter public high schools. Only traditional and charter high schools in the state of Florida were used in this project. For each charter high school selected, a cluster of four traditional high schools closest to that charter high school was created as a comparison group. The mean FCAT and SAT scores of the charter and traditional schools were selected for the years 2008, 2009, and 2010. A t-test: paired two sample for means was used to evaluate the data and test the null hypothesis that traditional public high schools and charter high schools have a mean difference of zero amongst their scores. The alternative hypothesis was that charter high schools performed worse than traditional high schools on both the FCAT and SAT. For each test and year examined, the null hypothesis was rejected every time; traditional high schools performed better. There may be intervening variables that create differences in performance levels; for example, student demographics, such as gender or age could be variables. It is recommended for this research to be modified, if completed again, to include analysis of demographics. The research can be expanded to include traditional public high schools and charter high schools in different states.

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## **Antibacterial Activity of Natural Plant Extracts on *Escherichia coli* and *Staphylococcus aureus***

**Palina Woodhouse, Bibiana Avendano, and Joanna Theodorou**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Julie Torruellas-Garcia and Dr. Venkatesh Shanbhag**

### **Abstract**

In recent years, medicinal plants have become increasingly popular as potential alternative treatments for a variety of ailments. Due to the growing problem of antibiotic resistant pathogens, development of new antimicrobials is a necessity. The essential oils of plants have many chemical components that exhibit antimicrobial, antibacterial, and anti-inflammatory properties. Biologically active plant extracts have the potential to combat the detrimental effects of pathogens without the risks sometimes associated with synthetic drugs. The purpose of the present study is to evaluate the antimicrobial efficacy of various classes of plants against gram-negative and gram-positive bacteria. During the study, the essential oils found in leaves, flowers, and the roots of plants were extracted using cold extraction methods and steam distillation. Methanol, ethanol, dichloromethane, ethyl acetate, hexane, and water were used as solvents. All the plants examined underwent both methods of extractions. The potency of the extracted oils was tested on *Escherichia coli* and *Staphylococcus aureus* by the disk diffusion method. The efficacy of the specific plant extract was analyzed by measuring the zone of inhibition. Preliminary results indicate that all spice, thyme, and cinnamon, extracted in dichloromethane, inhibited the growth of *S. aureus*. Anise and thyme, extracted in ethanol, inhibit the growth of *S. aureus*. Anise star and all spice, extracted in ethanol, inhibited the growth of *E. coli*.

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## **Attractiveness Perception: Contemporary and Classic**

**Scott Earley and Shannon Ali-Samhoul**  
Division of Social and Behavioral Sciences  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Glenn Scheyd, Jr.**

### **Abstract**

People have noticed that less attractive mates seem more attractive near the end of the night. Most blame alcohol consumption, but studies have shown (Johnco,C; Wheeler,L, 2010), (Sprecher, S; DeLamater, J; Neuman, N, 1984) that it is actually the reduction of the dating pool that creates the illusion of attractiveness. The focus of this study is to examine the perception of attractiveness people have when there is a reduced population of viable mates. One interpretation suggests that the perceived increase of attractiveness acts as a means to lower the standards of the yet unaware perceiver. There are certain set points that a person will have when the dating pool is ample, as soon as those levels decrease so does the person's set point. Researchers on this project give participants a short demographic survey, then randomly select to tell different participants whether a majority of people answered they were in a relationship or they were not in a relationship. We want to find out if a participant hears that more people are getting together in a serious relationship will affect their choices for attractive people. After the manipulation, we show the subject a series of photographs. We then ask them to judge the pictures strictly on attractiveness. We are determining that if there is a threat to the subject's availability to mates that participants will lower their set points of attractiveness toward the photographs. Initial data has shown support for our hypothesis, to be conclusive more data are needed.

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## **Body Position and Attention**

**Jana Mrkaja and Marianela Pena-Martinez**

Division of Social and Behavioral Sciences  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. W. Matthew Collins and Dr. Leanne Boucher**

### **Abstract**

The present study explores the effects of power posing on cognitive performance. Prior studies have shown that power poses, which involve expansiveness and openness of the limbs, prepare the individual to react faster and more accurately to stimuli. However, weak poses that involve contractive postures and closed limbs prime individuals to be more inhibited and vigilant, so they perform slower at tasks that require short reaction times, but more accurately on tasks that demand response inhibition. Our study evaluates the effects of strong and weak power poses within individuals. Participants were randomly assigned a strong pose and a weak pose in two separate sessions. During the session, participants were asked to hold a pose for 2 minutes, and then perform a task on the computer. This procedure was repeated three times in each session. Tasks were randomly presented. One of the tasks was the Stop Signal task which involves identifying two kinds of shapes when they appear on the screen, and withholding responses when the shapes are paired with a sound. Another was the global/local task, where small shapes form big shapes and participants are prompted to identify either the big shape or the little shapes that make up the big shape. The last task was the N-back task which tests working memory. Participants are presented with a sequence of letters and must respond when a target letter matches a letter either 1, 2, or 3 letters back in a sequence.

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## **Cloning of Functional and Regulatory Hypothetical Genes in Marine Microbe *Roseobacter denitrificans* OCh 114**

**Emily Lazowick and Shira Anteby-Maleh**  
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**Faculty Sponsors: Dr. Julie Torruellas-Garcia and Dr. Jose Lopez**

### **Abstract**

The goal of this project is to clone four selected genes from the marine microbe, *Roseobacter denitrificans*, which plays a significant role in the dynamic biogeochemical interactions of oceanic ecosystems. Two of these genes, *rodA* and *cheY*, which have known functions involved in structure, development, motility, and chemotaxis, will be used as controls to elucidate the functions of two hypothetical genes, “N-AcGlu” and *rhaI*, which are believed to be involved in sugar metabolism. *R. denitrificans* genomic DNA was isolated via the QIAgen DNA Purification Kit, and Restriction Fragment Length Polymorphism of 16S ribosomal DNA with the restriction endonucleases, *HindIII*, *RsaI*, and *MseI*, was used to verify the species. Polymerase Chain Reaction (PCR) will be used to amplify the four target genes. Then, carefully constructed plasmid vectors, antibiotic derivatives of pBBRI-MCS, will be used to clone each gene. The plasmids will be transformed into *Escherichia coli* JM109 competent cells, so that they can constantly regenerate and be extracted. A future aim of this project is to conduct site-directed mutagenesis of the cloned genes, which causes a decrease in gene expression and altered gene products with compromised functions. The mutated plasmids can be transformed into *R. denitrificans* to study the effects of the genetic mutations and ultimately the functions of the target genes. These techniques can be applied to many cultivable microbes to provide insight into the annotation of novel genes of interest, particularly those involved in secondary metabolism of pharmaceuticals, antimicrobial agents, and anti-tumor agents used in cancer treatment and prevention.

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## **Complete Synthesis of Carbonyl-Containing Compounds: A Guided Inquiry Approach**

**Amelia Hartzell**

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Farquhar College of Arts of Sciences

**Faculty Sponsor: Dr. Beatrix Aukszi**

### **Abstract**

This project focuses on the design of an upper level synthetic organic chemistry course, which is intended as a bridge between undergraduate organic chemistry courses and graduate school. It will allow students to gain useful experience in the laboratory before entering graduate or professional school.

The course will allow students to advance their abilities to evaluate novel work. Students will judge classmates' proposed synthetic routes, utilizing a peer-review approach. Novel synthetic routes focused on carbonyl chemistry will be designed, and the target compounds obtained will be purified and characterized throughout the course of the class. Research thus far has focused on developing both a starting compound and target molecule library. Proposed starting materials include Ethyl acetoacetate, Ethyl crotonate, 3-(2-Hydroxyphenyl) propionic acid, and acetic anhydride. The following target molecules were identified thus far: ethyl-2,4-dioxo-3-chromane carboxylate and ethyl-4,6-dihydroxy-2-methylcyclohex-2-ene-1-carboxylate. Different reaction types that will be utilized are the haloform reaction, keto-enol tautomerization, oxidation, and intramolecular ring formation. Successful syntheses will culminate with compound purification, utilizing column chromatography and HPLC methods. Full characterization will also be carried out on these products, employing FT-IR, GC-MS and NMR methods. At every course offering, new starting and target compounds will identified for students to design synthetic routes for. Considerations taken for this project are the timeliness of the reactions, as well as the safety and affordability of the compounds. It is designed to be affordable for a wide variety of school budgets.



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## **Contributions of Various Pollution Sources to the Air Quality in South Florida**

**Aarabhi Rajagopal**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Song Gao**

### **Abstract**

This study aims to understand the impact of various pollution sources, including ships and wildfires, on the air quality in South Florida. Based on docking schedules at the ports at Miami and Fort Lauderdale, the daily frequency patterns of ships and the heavy and light emission days are computed from 2009 to 2011. The levels of key air pollutants, such as fine aerosols and nitrogen dioxide, have shown to be elevated on select days, likely associated with ship emissions. Furthermore, a case study demonstrates the critical impact of episodic events on the regional air quality, even at a rather long distance. In May 2007, the infamous Bugaboo Scrub fire at the Florida-Georgia border generated a substantial amount of smoke. Detailed meteorological analyses show that certain wind conditions carried the smoke plume to South Florida, contributing to the very high aerosol concentrations observed that posed health threats to the public. During such events, precautionary notices can and should be brought to the public attention based on sound analyses of pollution sources and meteorological parameters.

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## **Creepy is Quickest but Sexy is Next: Evolved Psychological Mechanisms Impact Stimuli Processing Speed**

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**Faculty Sponsors: Dr. Valerie G. Starratt and Dr. Jonathan B. Banks**

### **Abstract**

Evolutionary psychological theory posits that humans have evolved psychological mechanisms (EPMs) that function to aid in survival and reproduction by processing stimuli perceived to be associated with specific problems of survival and reproduction. One such problem is that of identifying and securing a high quality mate. Consequently, people have EPMs devoted to processing information relevant to identifying high quality individuals who may be either potential mates or potential competitors against whom they may have to fight for access to mates. During mate value evaluation, however, it is possible that one mechanism may have to simultaneously process conflicting information. For example, facial attractiveness is an indicator of high genetic quality and, consequently, high mate value. Stinginess, or unwillingness to invest resources in a romantic partner, is a signal of low mate value in men. So, a woman in the presence of an attractive man who has been accused of being stingy must process both pieces of conflicting information in her evaluation of his worth as a potential mate. Established research in cognitive psychology demonstrates a cognitive cost to processing such conflicting information. The current study utilized a traditional cognitive methodology to examine the influence of stimuli relevance and similarity on cognitive processing speed. Results suggest cognitive costs are related to relevance of stimuli to the activated EPM, rather than to the presence of conflicting stimuli.

## **Devaluing the Drachma**

**Tiffany Smith and Cory LeVine**

Division of Humanities

Farquhar College of Arts and Sciences

H. Wayne Huizenga School of Business and Entrepreneurship

**Faculty Sponsor: Charles Harrington**

H. Wayne Huizenga School of Business and Entrepreneurship

### **Abstract**

This research focuses on the downfall of the Greek economy and the economic crisis it produced years after joining the European Union. By abandoning the drachma and adopting the euro, Greece lost the ability to devalue its currency during times of large national debt. If Greece had chosen to remain with the drachma, it may have increased its likelihood of escaping a national economic crisis, which has caused the unemployment rate to escalate and fueled public unrest. This paper will also address the cause of Greece's debt, the assistance it received from Goldman Sachs and similar banks, as well as the resounding effects this has had on the rest of the members in the European Union who use the euro as their national currency.

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## **Development of a Model Medical Device Using Highly Active Derivatized Proteinase Enzyme**

**Nicholas Ledra**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Terry McCaffrey**

### **Abstract**

This project is a continuation from a previous investigation from 2012. The objective is an at home, Point of Care testing device to monitor average glucose status of diabetic patients which has been proven more reliable. The technology involves a complex assembly of enzymes, hemolyzing agents, and electrodes, such that one drop of whole blood can be rapidly assayed for Hemoglobin A1c – a long term indicator of average day to day blood glucose levels.

Specific to the aspect of this work, two alternative proteinase enzymes, were compared. Our results clearly demonstrated that Proteinase K (Roche) is superior in its activity. Furthermore, the Proteinase K can be further potentiated by covalent derivatives using conventional polymeric substances well known to the pharmaceutical industry. The one selected was polyethylene glycol (PEG). Based upon the patent literature of Mountain View Pharm, authors of US Patent (7229810 B2). Our investigation formulated a synthetic strategy for a novel Enzyme- Polymeric conjugate bi-functional in nature. Our results clearly show that this Proteinase K- Polymeric conjugate had increased stability (confirmed by mass spectrometry), and had superior activity.

In order to make our findings compatible to the Medical Device, we formulated a strategy to covalently couple the conjugate to a silica based colloid that was confirmed by Indirect Infra-Red Spectroscopy. This allows for superior manufacture of the device and prevents enzyme migration off target. The Enzyme –Polymer- Silicon Dioxide colloid conjugate does retain the superior enzymatic activity while also provides stability and compatibility to the device architecture.

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## **Differentiation of Solutions of 2<sup>nd</sup> Order Boundary Value Problems with Integral Boundary Conditions**

**Alfredo Janson and Bibi Juman**  
Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Jeffrey W. Lyons**

### **Abstract**

In this talk, we make certain continuity and disconjugacy assumptions on second order boundary value problems with nonlocal integral boundary conditions. Given a solution of the boundary value problem, we differentiate the solution with respect to various boundary parameters. We show the resulting function solves the associated variational equation.

## **Don't Have Sight, Have Vision**

**Alessandra Sironi**

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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“Don't Have Sight, Have Vision” is a documentary film about the largest private agency in Florida to serve people of all ages who are blind or visually impaired. This agency is the “Miami Lighthouse for the Blind and Visually Impaired.” The documentary focuses on the music production program the agency offers to people with disabilities. Staff members teach people to develop their sense of touch through musical instruments and sounds in general. All people being interviewed in the documentary have signed a release by the agency. The documentary is directed by Alessandra Sironi.

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## **Enculturation through Ambiguity: Morality and Meaning in Children's TV Shows**

**Khadija Chowdhury**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Eric Mason**

### **Abstract**

It is easy to blame excessive “screen time” for the educational and behavioral difficulties that children face. And with children under the age of 6 watching an average of 2 hours of screen media a day, and older children averaging 4 hours a day, such practices deserve our attention. Children’s television shows in particular often get criticized for their thin content, gross humor, and “passive” viewing. But television shows *do* teach values and social conventions. And such enculturation need *not* be looked at as passive. As Haas and Flower write, “‘meaning’ does not exist in a text but in readers and the representations they build.” But how do television shows engage children in this active construction of meaning?

Looking at shows such as *Spongebob Squarepants*, *Lizzie McGuire*, and *Good Luck Charlie*, this study considers how television employs different methods for incorporating values into episodes using methods that require more or less work by the viewer to construct the underlying lesson. Online reviews of these shows vary greatly with some lambasting them as “inappropriate” due to “questionable language choices, violent conduct and vulgar ways.” Others look at the same show and find that it is “one of the best,” teaching “many positive words and lessons.” This study explores the way in which ambiguity in children’s shows not only invites such divergent interpretations, but also functions to encourage the active construction of meaning by viewers, teaching what Gee calls “ways of being in the world” that you “cannot overtly teach.”

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## **Evaluating Common Ion Concentrations in Bottled Drinking Water and Local Marine Water**

**Karem Molinares and Roshni Patel**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Song Gao**

### **Abstract**

Various ion concentrations in bottled drinking water, campus drinking water, and local marine water have been measured by chromatography and other techniques to evaluate their environmental and health impacts. Different bottled drinking water has been tested for ion (including chloride and sulfate) concentrations. The results are compared to the values reported by the distributing companies as well as the EPA national standards. Non-concurrence was rare but existed in certain samples. The samples are also tested for chemical and biological signatures after exposure to sunlight over various lengths of time. In the field, a series of marine water samples collected in outflows near Port Everglades in 2013 - 2014 have been analyzed for ion concentration profiling. In addition to seasonal trends, highly positive correlations among several ion concentrations have been observed and are discussed along with their implications in the coastal environment.



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## Evaluating the Effectiveness of a Campus-Wide Exercise Program on Faculty and Staff Health

**Katharine Fleming**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Corey Peacock**

### Abstract

**Purpose:** Obesity affects nearly 33% of the adult population and is estimated to increase to 50% by the year 2020. In anticipation of this trend, we evaluated NSU's campus-wide fitness program "Slimming with the Sharks" on improving indicators of faculty and staff health. **Methods:** 22 obese faculty and staff ( $35 \pm 10.7$  yrs.;  $36.8 \pm 3.6$  BMI) completed the program. The campus-wide fitness program consisted of 72 personal and group exercise sessions training cardiovascular endurance, muscular strength, and mobility. In addition to the exercise, participants were offered optional educational presentations on health and wellness. As an evaluation of the program, we measured pre- and post- indicators of health including cardiovascular endurance, body composition, muscular strength/endurance, flexibility, body mass index, and hypertension. **Results:** A repeated-measures analysis of variance (ANOVA) demonstrated significant ( $p \leq 0.012$ ) improvements in body composition ( $43.7 \pm 0.1$  % pre,  $37.7 \pm 0.1$  % post), muscular strength/endurance (push-up  $7.0 \pm 6.1$  reps. pre,  $16.6 \pm 10.2$  reps. post; curl-up  $16.8 \pm 8.9$  reps. pre,  $23.7 \pm 3.0$  reps. post), flexibility ( $22. \pm 15.0$  cm. pre,  $29.3 \pm 10.2$  cm. post), BMI ( $36.8 \pm 3.6$  pre,  $32.9 \pm 4.3$  post), and blood pressure ( $124.7 \pm 6.8$  mmHg SBP pre,  $115.3 \pm 6.8$  mmHg SBP post;  $82.6 \pm 6.7$  mmHg DBP pre,  $78.1 \pm 11.5$  mmHg SBP). **Conclusion:** NSU's "Slimming with the Sharks" effectively decreased body fat %, BMI, and blood pressure in faculty and staff. It also effectively improved muscular strength/endurance and lower back flexibility. Additional NSU support may be warranted to improve future exercise programs.

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## **Faunal Associations with Native and Nonnative Landscapes**

**Shannon Aldridge and Tylia Hernandez**  
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**Faculty Sponsor: Dr. Paul Arena**

### **Abstract**

The relatively new native landscape on the East side of Nova Southeastern University's Parker building provided an opportunity to compare its associated faunal communities with those from an exotic landscape on the West side of the Parker building. Weekly visual surveys using a belt transect were conducted on both sides of the building on the same days over the study period. Four surveys have been completed thus far and 99 individuals were recorded in the native landscape while 87 were recorded in the exotic landscape; of those in the exotic landscape 35.6% were exotic animal species. The most abundant species over all was the native halictid solitary bee. Contrary to our expectations, only eight species were recorded in the native landscape, whereas 12 species were noted in the exotic landscape. While this does not support the hypothesis that native plants bring in more native fauna and support higher biodiversity than non-native plants, our preliminary result could be due to limited time for the new landscape to establish. The exotic landscape has been in place for at least ten years and the native landscape was planted April 2013. Many of the native plants are small and have yet to reach their mature size.

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## **Fishing for Answers: NSU's Freshwater Fish Community**

**Rialto Heller**

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**Faculty Sponsor: Dr. Paul Arena**

### **Abstract**

The purpose of this study was to assess the freshwater fish community at Nova Southeastern University (NSU). Thus far, six cast net surveys were conducted in canals and ponds on main campus. Fishes were released after total length, weight, and species identification were recorded. Water temperature, pH and dissolved oxygen were also measured at the sample sites. Preliminary results revealed a total of 109 fishes of 10 species from five families were recorded. A total of six native species was identified. The most abundant native species was the bluegill (*Lepomis macrochirus*), which made up 40% of the natives recorded, but only six individuals were caught over the study period. The remaining natives included the largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), striped mullet (*Mugil cephalus*), alligator gar (*Atractosteus spatula*) and the florida gar (*Lepisosteus platyrhincus*). The most abundant fish species overall was the exotic spotted tilapia (*Tilapia mariae*) at 53 individuals. Shockingly, 85% of the total catch consisted of exotic, invasive species. The other exotic species recorded were blue tilapia (*Oreochromis aureus*), Mayan cichlid (*Cichlasoma urophthalmus*) and sailfin catfish (*Pterygoplichthys batrachus*). Invasive species are known to displace natives and thrive in degraded urbanized canals. Exotic cichlid species, which include three of the invasive species in our study, are known to have a similar ecological role as Florida's native sunfishes and may be impacting their local abundance.

## **For the Need of Change**

**Antonella Sanchez**

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**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“For the Need of Change” is a short documentary film about an organization by the name of *DREAMers’ Moms*. This new group is composed of novice leaders who have stepped out of the shadows, feeling empowered by their fellow members, and have actively joined the movement toward equality and justice in the immigrant community. These women from across the United States are sacrificing their personal time in an attempt to make positive changes in the lives of the more than eleven million undocumented immigrants living in this country. *DREAMers’ Moms* co-founder and president Alejandra Saucedo was interviewed about the foundation and trajectory of this year-old organization. Saucedo explains that what started out as a simple idea quickly evolved into something more than they could handle. It has not been easy, but this group of mothers has no limit and is not stopping anytime soon, because the need for change is greater than their fears.

## **Full Time Moms, Full Time Heroes**

**Paola Zaidi**

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**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“Full Time Moms, Full Time Heroes” is a documentary film about women who by their own volition decided to quit their jobs and become full-time moms. Did they make a mistake? Are they as happy as they thought they would be? How fulfilled do they feel in their lives? Do they feel appreciated and compensated in any way? Many women who work full-time dream of the day they don’t have to go to work and can just stay at home enjoying themselves. Many of our impressions of stay-at-home moms come from reality television shows; are such impressions similar in any way to the reality of a true stay-at-home mom? The documentary is directed by Paola Zaidi, and includes interviews with real mothers in south Florida.

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**George Eliot's *The Mill on the Floss* as *Écriture Feminine***

**Shiri Moshe**

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**Faculty Sponsor: Dr. Kathleen Waites**

**Abstract**

In her influential treatise “The Laugh of the Medusa,” poststructuralist French theorist Helene Cixous explores the notion of text marked by gender, and notes its importance in subverting the patriarchal structures that perpetuate female oppression within the dominant, phallo-centric social and political order. By analyzing the criteria set by Cixous, and applying them to George Eliot’s The Mill on the Floss, my research demonstrates that Eliot’s novel firmly adheres to several key poststructuralist, feminist principles, and contends that it can thus be viewed as an example of *écriture féminine*, or a fluid, subversive feminist work, which highlights socially constructed gender inequality in order to galvanize communities towards social change.

## **Google Analytics for Online Education**

**Priscila Reyes**

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**Faculty Sponsors: Dr. Alvaro Escobar and Dr. Michael Van Hilst**

### **Abstract**

This work explores the idea of improving e-learning objects through the use of analytics modeled after Google Analytics. Prior work on the use of metrics in e-learning has focused on user satisfaction, and the ranking and selection of learning objects from a set of available choices. The work is unique in its focus on the kinds of metrics needed to improve an existing e-learning object, and more specifically to make improvements to specific pages within an e-learning object. The approach is based on the now well-established track record of using Google Analytics for website optimization in e-commerce. The work presented here addresses adaptations needed to apply similar metrics in the context of e-learning and more specifically e-learning objects.

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## **Guided Inquiry: Synthetic Investigation of Aromatic Systems**

**Christopher Lynch**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Beatrix Aukszi**

### **Abstract**

The focus of this investigation is to aid the development of a new advanced synthetic organic chemistry course, aiming for the development of possible synthetic routes of aromatic systems. Through a guided inquiry approach, students will be in charge of designing an entire synthetic route to develop a target compound. Proposed projects will be presented in-class, and feedback will be provided using a peer-review system to allow for improvements. Refined routes will then be carried out in the laboratory. Target compounds will then be purified, using common organic purification methods, such as column chromatography and HPLC, and then subjected to full characterization using methods, such as FT-IR, GC-MS, NMR, and UV/Vis spectroscopy.

This project has focused on the development of a library of naturally occurring target molecules, and suitable starting compounds. The difficulty and originality of this project resides from the fact that no synthetic routes for the target molecules have been published to date. Further difficulty originated from choosing starting and target compounds that were fiscally reasonable, challenging but not beyond an undergraduate student's ability to synthesize, and above all else safe. Over the last several months synthetic targets that have been investigated are 5-(bromomethyl)-1,3-dihydroxy-9H-xanthen-9-one and 3-[N'-(3-bromo-2-hydroxy-5-nitrophenyl) hydrazinocarbonyl] propanoic acid. Additionally, some starting compounds that are currently being utilized are 3-methylsalicylic acid, 2-amino-4-nitrophenol, benzene-1,4-diamine, and sulfanilic acid. Proposed synthetic routes will be fully tested in the laboratory and obtained target molecules will be purified and characterized. The developed target molecule library will be the starting point for this guided inquiry course.



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## **Hawaiian Monk Seals - Record of Environmental Influence in an Endangered Species**

**Joseph Deek, Jaime Gonzalez, Mikaela Edwards, and Courtney Cenkner**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Amy C. Hiron**

### **Abstract**

The Hawaiian monk seal (*Monachus schauinslandi*), along with their genetic cousin the Mediterranean monk seal, is one of the most endangered species on the planet, largely due to a combination of environmental and anthropogenic influences. The analysis of both organic and inorganic components of the animals' tooth and bone complexes, in coordination with age assessment, will allow us to ascertain critical information regarding changes to their habitats and the effects of such changes on the animals. Tooth and bone samples from 225 naturally deceased Hawaiian monk seals, encompassing the past four decades, have been collected from the Northwest Hawaiian Island chain (NWHI) and Main Hawaiian Islands (MHI). The stable carbon, nitrogen and oxygen isotope ratios ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$ , respectively) provide a record of dietary and environmental change and are reflected in the growth of a tooth and bone collagen as the animal ages. One hundred thirty-six canine teeth are being sectioned and growth layers counted to ascertain the age of the animals for specific years' data. Two hundred twenty bone samples have had collagen extracted and processed for stable isotope ratios. Primary productivity within the central and southern NWHI is much less than the productivity seen throughout the northern NWHI. Less production indicates less food and longer food webs for the organisms in these areas. These data provide information critical to the survival of not only this endangered species but all marine organisms in the region.

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**Histological Analysis Investigating the Deepwater Horizon Oil Spill's Impact on Gut Tissue of  
*Crassostrea virginica***

**Ji Hae Hwang and Timothy Chung**  
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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Deanne Roopnarine**

**Abstract**

The *Deepwater Horizon* drilling rig explosion in 2010 led to the leakage of approximately 4.9 million barrels of oil from the Macondo well. The well was located about a mile under the water surface and its discharge covered a vast area of the northern Gulf of Mexico. Studies have shown that the presence of the oil, or the dispersants used after the incident, may have toxic effects on marine life. The eastern oyster, *Crassostrea virginica*, is an ideal species to analyze because it is a filter feeder; utilizing the gills for filtration and directing the food to the rest of the digestive tract. The digestive system filters out any harmful substances entering with the food and eliminates them as waste. Filtration occurs due to the ciliary motion of the digestive epithelial lining and any alteration results in its failure. It is hypothesized that the decrease in ciliary motion coupled with atrophy of the digestive diverticula will have an adverse effect on specimen. The specimens were collected from Grand Isle, Louisiana; Dauphin Island, Alabama; and Apalachicola Bay, Florida from 2010-2013. The control specimens were from Chesapeake Bay, Maryland. Analysis of the digestive tissues was done utilizing histological techniques. Further study will continue utilizing an increased sample size.

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**Infection Rates of Asian Fish Tapeworm (*Bothriocephalus acheilognathi*) in Three Commercially Available Poeciliid Fishes (Molly, Platy, and Swordtail)**

**Amrita Choithani**

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**Faculty Sponsor: Dr. Christopher Blonar**

**Abstract**

The Asian fish tapeworm (*Bothriocephalus acheilognathi*) has been widely introduced beyond its native range into several localities across the USA, largely via the aquaculture of imported Cyprinids. This tapeworm can infect a wide range of fishes, and is considered pathogenic, particularly in small-bodied or juvenile fishes. Consequently there is significant concern over the potential of this parasite to escape from aquaculture sites and subsequently infect native fishes. Fish acquire *B. acheilognathi* when they consume infected copepods, which acquire the parasite when they consume larvae recently hatched from the feces of infected fishes. Thus, fish cultured in ponds and feeding on copepods are more likely to be infected with *B. acheilognathi* than those cultured in tanks given pelleted feed. Poeciliids are commercially important fishes cultured in ponds throughout Florida for the aquarium trade. Native to Asia, they are also known to be suitable hosts for *B. acheilognathi*. However, infection rates of *B. acheilognathi* in Florida-cultured Poeciliids remain unknown. To address this knowledge gap, we purchased 30 fishes (10 molly, 10 platy, 10 swordtail) from a local aquarium supply company, and examined them for parasites. We confirmed the presence of *B. acheilognathi* in molly (mean intensity = 1; prevalence = 30%), but not in other Poeciliids. The only other parasite detected was the Acanthocephalan *Neoechinorhynchus* sp., in platy (mean intensity = 1; prevalence = 20%). Thus, although commercially available Poeciliids typically have few or no parasites, we confirm that molly host *B. acheilognathi*. The potential risk this poses to native fishes requires further study.

## **Infinite**

**Juan Rivera**

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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“Infinite” is a short film about a young woman going about her “normal” day. She seems to be interacting with someone off-screen through most of the film. Towards the end of the film the audience discovers the truth about this mysterious off-screen person. The film is directed by Juan Rivera. Jessica Rivera is a crew member and actor in the film.

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## **Inhibition of Angiotensin-Converting Enzyme-2 (ACE-2) Activity and Radioligand Binding of a Putative ACE-2 Inhibitor**

**Andrea Linares**

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Farquhar College of Arts and Sciences  
Nova Southeastern University College of Pharmacy

**Faculty Sponsor: Dr. Robert Speth**

### **Abstract**

The objective this study was to test the efficacy of a novel angiotensin-converting enzyme-2 (ACE-2) inhibitor JFS101. A potent inhibitor of ACE-2 (MLN-4760) was developed, but then abandoned when it became clear that ACE-2 metabolizes angiotensin II (Ang II) to form Ang 1-7. We developed a radioiodinizable analog of MLN-4760 (JFS101) that would more closely mimic Ang II. Both the uniodinated and monoradioiodinated as well as the S,S versus the S,R analogs were tested for their ability to inhibit ACE-2 metabolism of an artificial ACE-2 substrate (MCA-APK[Dnp]) using recombinant human ACE-2 (rhACE-2) and for their ability to bind to ACE-2 in rat lung, and kidney membranes. In the results, the S,S isomer of JFS101 inhibited rhACE-2 in the nanomolar range and was 5-10% as potent as MLN-4760. The S,R isomer inhibited rhACE-2 activity in the low micromolar range. Radioligand binding assays using  $^{125}\text{I}$ -JFS101 (S,S isomer) revealed a high level of binding to lung and kidney membranes; however, less than 10 % of this binding was displaceable by 1  $\mu\text{M}$  MLN-4760. In contrast, 2 mM EDTA inhibited ~80 % of total binding at 3 -35 nM  $^{125}\text{I}$ -JFS101. In conclusion, the EDTA displaceable  $^{125}\text{I}$ -JFS101 binding was not saturable, suggesting that the  $K_D$  of  $^{125}\text{I}$ -JFS101 for lung membranes is  $\gg$  35 nM. The inability of MLN-4760 combined with the ability of EDTA to inhibit  $^{125}\text{I}$ -JFS101 binding suggests that  $^{125}\text{I}$ -JFS101 is not selective for ACE-2, but rather binds to other metallopeptidases that may be identified in future research.

## **Life After College Athletics**

**Kristen Ghandour**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

### **Abstract**

“Life after College Athletics” is a short documentary film about former collegiate athletes who are struggling, or who have previously struggled, after their collegiate careers end. The film explores issues such as anorexia, bulimia, drug use, and depression, among other issues, that have been found to occur in some ex-collegiate athletes after ending their sporting careers. The documentary’s goal is to bring awareness to these issues that are often ignored. The film is directed by Kristen Ghandour.

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## **Literature and Medicine Courses: Examining Descriptions, Making Connections**

**Kamila Albert**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Edwin Stieve**

### **Abstract**

The interdisciplinary field of “Literature and Medicine” aims to reintroduce the reflective study of literature into the scientific, data-driven world of healthcare. This broad subject allows for a range of teaching methodologies, often constructed in accordance with an instructor’s research or literary interests, which serve to make classes distinct. Notably, however, the language of “Literature and Medicine” course descriptions, which represent the most concise summaries of courses, often feature similar terms, concepts, and, at times, authors. This is not surprising when one considers that these carefully constructed descriptions must effectively bridge two very different subjects. Therefore, this research project evaluates the language of “Literature and Medicine” course descriptions in order to examine how instructors choose to represent these classes in undergraduate and graduate curricula. The study includes courses from a 20-year span that fall into two categories: “Literature and Medicine” and “Special Topics in Literature and Medicine.” Using data visualization and word frequency programs, this research considers how these course descriptions use select terminology to link the disparate fields of medicine and literature. Through this research, the project intends to answer the following questions:

- 1) What are the most common terms, concepts, and authors featured in a “Literature and Medicine” course description and what do these terms convey about the content and particularity of “Literature and Medicine” courses?
- 2) What changes have occurred in the language of course descriptions over the past 20 years and what do these changes suggest about the field generally?

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## **Manager View – An Interface for Generating Actionable Data from Repository Metrics**

**Stephan Vanwoezik**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Michael Van Hilst**

### **Abstract**

This computer science project creates an online tool for software development managers. The tool makes quick analysis of a software development company's project repository. Manager View does something that no existing software does, by allowing the user to view repository metrics in a new and meaningful way. This analysis of repository data can offer insight into the quality and quantity of developers, their actions and the software artifacts they generate. In this project we demonstrate how such data can be used to reveal actionable information. The views show daily employee and task activity in a way that gives a sense of timespan, depth and scope of work contributed. Traditionally, process improvement is done after the fact when insights are collected as a postmortem. With this tool, insights are available every day and managers can use such insights to steer work in progress. Using web technologies to access the repository database, Manager View creates views that reveal developer workloads and the detailed status of all tasks and developers, at any given moment, or at any historical point in time.



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## Mechanism of Apoptosis Induced by Phycocyanin in LNCaP and A549 Cancer Cells

**Haley Nation, Omar Garcia, and Omar Viqar**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Mark Jaffe**

### Abstract

Phycocyanin is a pigmented protein found in cyanobacteria produced by *aphanizomenon flos-aquae* (a freshwater species of blue-green algae) and *spirulina*. Phycocyanin (PC) has been researched extensively in the last twenty years because of its anti-cancer properties. Despite numerous critical findings, the anti-cancer mechanism for how PC induces apoptosis in cancer cells is still unknown.

The purpose of our experiment was to determine the uptake of PC by cancer cells and then study different mechanisms of apoptosis. PC naturally emits red fluorescence, which was utilized to verify the uptake by LNCaP prostate cancer cells. We were able to determine that PC only binds to the cell membrane; therefore we suspected that PC must interact with a membrane protein for inducing apoptosis. Since apoptosis mechanisms are regulated by an anti-apoptosis protein Bcl-2, we examined the effect of PC treatment on Bcl-2 levels. Electrophoretic separation of proteins from the LNCaP cells and a western blot analysis showed PC down regulated Bcl-2. Topotecan (TPT) an anti-cancer drug was used as a positive control to down-regulate Bcl-2 levels in A549 lung cancer cells. The combination of both PC and TPT resulted in greater down regulation of Bcl-2 that might be triggering apoptosis in cancer cells. Understanding the complete mechanism inducing apoptosis is critical for PC to be considered as a possible complimentary agent during cancer treatment. (This project was supported by the Ester-King Biomedical research program of the state of Florida).

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## **Neural Stem Cells Proliferate in Vascular Niches in the Adult Mayan Cichlid Brain**

**Zara Khan, Jonathan P. Romanes, and Sameed Ashfaq**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. James R. Munoz**

### **Abstract**

The birth of new neurons (neurogenesis) has been observed in all adult mammalian brains examined to date. Adult neural stem cells are located close to blood vessels in each of the two neurogenic regions observed in all mammals. A regulatory role for blood vessels has recently been suggested as a mechanism to regulate neurogenesis. Postnatal neurogenesis has been reported in several regions of the fish brain including the olfactory bulb, dorsal zones of the telencephalon, hypothalamus, and divisions of the cerebellum; however, little else is known about neurogenesis in the adult fish brain. Using thymidine analog incorporation assays, cell death assays, and immunofluorescence, our preliminary observations suggest that neural stem cells in the adult Mayan Cichlid brain proliferate in vascular niches and migrate along blood vessels prior to maturing. The focus of this independent study was to better understand the cell cycle kinetics in the different neurogenic brain regions. We have found neural stem cells migrate away from the vascular niches in Edu<sup>+</sup> cells on day 14 compared to those cells which are clustered in close proximity to those same vascular niches at day 1. We have found the most dense neural stem cell regions in the intermediate cerebellum and cerebellum and will quantify cell distances from vascular niches over time versus how many of those cells are proliferative versus migrating or maturing stem cells. We expect to find significant migration from day 14 to day 28 when the neural stem cells migrate away from the vasculature as they mature.

## **Neurogenesis in *Octopus vulgaris***

**Jelileh Whitmore**

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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. James R. Munoz and Dr. Jaime L. Tartar**

### **Abstract**

Cephalopods, particularly the octopus, have the largest and most complex invertebrate brains and show markers of behavioral complexity. Several mammalian studies have demonstrated a correlation between learning and neurogenesis (the birth of new neurons) in the hippocampus of the adult brain. The vertical lobe of *Octopus vulgaris* is thought to be analogous to the hippocampus of mammalian brain; however, neurogenesis has never been reported in the octopus. We used thymidine incorporation assays and immunostaining to demonstrate neurogenesis in the developed octopus brain. We are currently examining the proliferation, differentiation, integration, and cell death of newly born neurons in the octopus brain. Future studies will test for concomitant changes in behavioral learning and neurogenesis.

## **Next Generation Event Scheduling System**

**Jeremy Cantor**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Saeed Rajput**

### **Abstract**

Current event scheduling systems are often inefficient. Traditional business practices, such as employing office assistance to manually record event times requires the customer to languish needlessly on the telephone while waiting receive assistance and to repeat that process several times to establish just one appointment or a meeting. New software scheduling tools significantly reduces errors, yet they are still modeled after traditional processes. We have proposed to model scheduling as a “protocol” and use a visualization approach to depict the process. Using this protocol approach, the project includes analysis of the traditional scheduling processes. We have identified the inefficiencies that occur and have proposed a new protocol that utilizes the software tools to make scheduling faster and less arduous. We have also demonstrated this scheduling procedure through a software prototype that we developed. This protocol is flexible and minimizes the number of transactions between participates.

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## **Particulate Matter Induces Opportunistic Emergence of Antibiotic Resistance**

**Divya Pandya, Arti Patel, and Emma Magner**

Division of Math, Science, and Technology

Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Song Gao and Dr. Robert P. Smith**

### **Abstract**

It is becoming increasingly recognized that particulate matter in the atmosphere is a significant global health threat and environmental concern. Byproducts from burning of biomass or fossil fuels, polyaromatic hydrocarbons (PAHs), comprise a substantial fraction of particulate matter in many areas. Previous studies have indicated that many PAHs are carcinogenic in mammalian cells and have mutagenic potential in microorganisms such as bacteria. However, the consequences of such mutations in bacteria remain relatively unexplored. In this study, we examine the ability of selected compounds commonly found in particulate matter to generate antibiotic resistant bacteria. We observed that separate treatment with an individual PAH - 1-nitropyrene, benzo(a)pyrene, pyrene and 2-nitrofluorene - can significantly increase the occurrence of *Escherichia coli* that are resistant to rifampicin and kanamycin. Furthermore, we observed that treatment with two of these compounds together increases the frequency of rifampicin resistant bacteria in an additive fashion. Finally we found that rifampicin resistant bacteria obtained after treatment with 1-nitropyrene or 2-nitrofluorene can resist rifampicin up to the solubility level of rifampicin in growth medium, suggesting mutants derived under these conditions may be highly resistant to antibiotics. Preliminary results from the treatment of *E. coli* with ambient aerosol samples will also be discussed. Overall, our study presents evidence that ubiquitous compounds in particulate matter may serve to increase the rate at which antibiotic resistance evolves in the environment.

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**Philosophically Speaking, Capital Punishment Is Not The Answer.**

**Nathaniel J. Dolan**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Charles Zelden**

**Abstract**

Like all species of animal creature on our planet, humans – each and every one – are entirely capable of committing the most heinous acts imaginable. What draws the distinction for the criminal elements among us is merely a missing level of restraint in the face of conflict, duress, pressure, disappointment, perceived threats, and our own immutable passions. When responding to criminal acts through a system of jurisprudence we are each forced to confront the morass of distinct philosophies underscoring the particular issues. The American system of justice is fundamentally flawed in that it simply cannot determine the most effective bases for our responses to crime and the reduction thereof. Some believe strongly that the response to crime should be based in simply meting out fit punishment for mere retribution's sake. Other arguments assert a utilitarian approach for protecting society from future crimes and that the most valid basis for sentencing is the mere removal of criminal elements from our midst entirely with neither reservation nor any particularly moral platitudes. Another approach to sentencing and reducing crime is founded on the principle of deterring future crime by punishing severely those who break our laws as an unambiguous warning to others. Still others argue that sentencing ideals should be fundamentally based upon the model of rehabilitating criminals and their potential re-assimilation to society. There just doesn't seem to be footing firm enough for any one of these distinct principles to prevail over the others. However, in terms of capital punishment, a rather unique characteristic emerges requiring distinct consideration from a whole new order of deliberation.

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## **Predicting Porphyrin Basicity Using Semi-Empirical Methods**

**Haley McKissack**

Division of Math, Science, and Technology  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Maria Ballester**

### **Abstract**

Porphyrins are macrocycles found in many natural compounds. The changes in energy between the protonated (dication) and free base porphyrins were determined using molecular modeling. The data obtained was then compared to experimental enthalpy values. The porphyrins analyzed were octaethylporphyrin, octaethyltetraphenylporphyrin, tetraphenylporphyrin, and tetra-[2]-pentylporphyrin. Molecular mechanics was employed to optimize each porphyrin, and semi-empirical calculation methods RM1 and PM3 were subsequently utilized to test the conformational energies of the protonated and deprotonated porphyrins. The semi-empirical PM3 method was best for analysis of energy changes among the porphyrins; although the obtained values did not exactly match experimental values, the trends of energy differences between the tested porphyrin and base porphyrin when protonated and deprotonated did show correlation with the experimental enthalpy values. The greatest energy change from deprotonated to dicationic with respect to the free-base porphyrin was in the dodecasubstituted porphyrins.

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## **Reality and Rhetoric: U.S. Foreign Policy and Egypt's Arab Spring**

**Shiri Moshe**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. G. Nelson Bass**

### **Abstract**

The Arab Spring, a series of revolutionary civil uprisings that swept across the Middle East and North Africa in 2011, has drastically transformed the Egyptian political sphere. Egypt, designated a major non-NATO ally by the United States (Foreign Assistance Act, 1989), is one of the largest recipients of U.S. economic and military assistance. Its domestic developments have consequently been of major interest to the Obama administration. Drawing from relevant executive statements and releases, major news media and Congressional Research Service reports, and peer-reviewed publications, my research delineates the public rhetoric and actions of the U.S. executive office towards the state of Egypt within the framework of the ongoing Arab Spring. It specifically examines the administration's reaction to the mass civil protests against former President Hosni Mubarak, his ousting, the establishment of an interim government, the succession of President Mohamed Morsi, and ends with General el-Sisi's military coup. By contrasting both the rhetoric and actions of the administration towards these events, my research examines the congruence between U.S. pronouncements and policies as they pertain to Egypt, highlights tensions, and serves to assess U.S. interests within the state.



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## **Sensation Seeking Behavior and Aggression: Predictors of Low Physiological Arousal Under Stress**

**Jose Serrano and Mustari Akhi**  
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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Tom Fagan, Jessica Garcia-Brown, and Dr. Jaime L. Tartar**

### **Abstract**

Using the Bimodal theory of violence, aggression can be dissected into two distinct modes: affective violence and callous-unemotional violence (i.e. predatory violence) where the aggressor is physiologically “under-aroused” (Tulogdi, et al., 2012). These individuals also demonstrate sensation seeking behaviors as a way of increasing arousal. Combined, this suggests that sensation seeking behavior can serve marker of aggression and physiological under-arousal (Wilson and Scarpa, 2011). In order to test this idea, we examined the extent to which sensation seeking behavior was associated with physiological and self-report responses to acute stress (the cold pressor test, CPT). We found that sensation seeking behavior is associated with self-reported aggression and some measures of low physiological arousal. In particular, we found a positive correlation between self-reported aggression and sensation seeking behavior ( $p < 0.05$ ). In addition, S-IgA, a marker of immune functioning and stress level, is negatively correlated with sensation seeking behavior before ( $p < 0.05$ ) and 1 min after ( $p < 0.05$ ) the CPT stress. High aggression is related to low baseline and post-stress cortisol levels ( $p < 0.05$ ). Finally, sensation seeking behavior was negatively correlated with self-reported pain perception of the CPT stressor at three different time-points: 1 minute before the CPT (anticipated pain), during the CPT (experienced pain), and 20 minutes after the CPT (recalled pain) (all  $p$ 's  $< 0.05$ ). Combined, these findings suggest that both aggression and SS are related to low physiological arousal, but that aggression is associated with low HPA axis activity while sensation seeking appears to involve SNS mechanisms.

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## **Source Memory Recognition**

**Rayna Orsini**

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**Faculty Sponsors: Dr. W. Matthew Collins**

### **Abstract**

This experiment examines how timing impacts source memory. Previous studies have found that preverbal infants may remember events, but cannot retroactively apply language to describe the event (Simcock and Hayne, 2002). Previous experiments tested individuals' source memory of symbols and animals that they learned the names of either before or after they encountered them. Individuals better recognized symbols and animals they had learned the names of before they encountered them rather than after, leading us to believe that timing of learning affects source memory recognition (Collins et al., 2011). However, poor performance on the stimuli learned after they were encountered could be due to memory interference effects. Experiment 1a consisted of a learning phase, followed by an exposure phase. After this exposure phase, a 30-minute distractor task was implemented, followed by a second learning phase and a memory test. In Experiment 1b, the procedure was the same as 1a, except the distractor task was between the first learning phase and the exposure phase. If memory for stimuli learned after exposure is affected by memory interference, a distractor task between the exposure phase and the second learning phase should help prevent source interference between the learning phase and exposure phase. Thus, it is predicted that a time lapse between the first learning phase and exposure should have no effect on memory interference, but a distractor between the exposure and the second learning phase should decrease the effects of interference on memory.

## **Symbolist Movement of Modern Theatre**

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**Faculty Sponsor: Jane Duncan**

### **Abstract**

A quote by the French symbolist playwright Paul Claudel claims, “All that passes is raised to the dignity of expression; all that happens is raised to the dignity of meaning. Everything is either symbol or parable.” The development of the symbolist movement of modern theatre from 1874 to 1915 gained clout through those who shared in Claudel’s observation. Throughout the paper, the symbolist movement of modern theatre will be explored along with those who struggled to make the movement come to life on the stage. The struggle between realists and symbolists concerning what is real and what is incredulous fantasy will also be viewed in this work. Claudel’s play *The Tidings Brought to Mary*, written toward the end of the movement and still performed post movement, will be used as an aid in deciphering the necessity of symbolism in theatre.

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## **Synthesis and Characterization of Oxindole Derivatives; Potential Antibacterial, Antimitotic, and Antitumor Applications**

**Karem Molinares, Bansi Savla, and Kaitlyn Pope**  
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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Venkatesh Shanbhag and Dr. Eduardo Véliz**

### **Abstract**

In the recent years, analogues of Indolin-2-one (2-oxindole) have been found to be highly effective in inhibition of pro-inflammatory cytokine IL-2 of Multiple Sclerosis. Researchers around the world have focused on methodical modification at several key locations of the molecule with the intent of studying the biological activities. In that line, this research focuses on the synthesis of Knoevenagel adducts with a variety of aromatic aldehydes. In this research, sixteen derivatives of 2-oxindole have been synthesized and characterized by traditional techniques (melting point, FT- IR, and NMR). The potential use of these derivatives is initially to study the anti-bacterial and anti-mitotic effects and then to explore broader biological studies.

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**Tail Spine Characteristics of the Yellow Stingray, *Urobatis jamaicensis* (Order: Myliobatiformes), of Broward County, Florida**

**Ana Rehman**

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**Faculty Sponsor: Judy Robinson**

**Abstract**

The barbed spine of the yellow stingray, *Urobatis jamaicensis*, has a unique architecture and histology. The spines are stiletto-shaped and flattened with lateral serrations that point backwards. Venom-secreting glandular cells incased in by integument run along two longitudinal grooves for the length of the spine. *Urobatis* has one or more barbs (modified dermal denticles) located on the dorsal side of the ray's tail, which often is used for defense. Previous research has reported the existence of tail spine asymmetry by geography, sex and age in 12 species of stingrays (Schwartz, 2007). This study examined tail spine length and number of serrations in *Urobatis jamaicensis* based on gender. Tail spine characteristics, i.e. length and serrations by gender, of 59 *Urobatis* caudal tail spines collected off inshore waters of Broward County, Florida were examined. Although spine lengths varied with gender, length was not correlated with gender ( $p > 0.05$ ). Furthermore, no gender differences were found with serration numbers ( $p > .05$ ), although serration numbers appeared to increase with spine length. It was found that Broward County *Urobatis* averaged smaller than other documented stingray spines indicating additional information on this morphological character may aid in defining ray species and their habitats.

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## **Tetraphenylporphyrin Derivatives and Octalkyl Porphyrin Interactions in Cancer Cells**

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**Faculty Sponsor: Dr. Maria Ballester**

### **Abstract**

Synthetic porphyrin molecules are commonly studied as photosensitizing agents in photodynamic therapy as a form of cancer treatment. The porphyrin molecules target cell organelles to induce cellular apoptosis, or navigate toward the cellular membrane, causing tissue necrosis. This porphyrin activity is primarily undetectable and only activated under the exposure of light. The chemical structure and properties of porphyrin compounds have varying effects on their success and viability in this treatment. The study of tetraphenylporphyrin derivatives and octalkyl porphyrin compounds can be implemented in finding suitable compounds for this technique.

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## **The Effect of Physical Stress on Alpha Amylase Concentration in Saliva**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Jaime L. Tartar**

### **Abstract**

Alpha amylase is an enzyme found in saliva, and is integral in the breakdown of large polysaccharides such as starch and glycogen. In addition, it also increases in response to physical stress, making it a useful indicator for pain threshold. In an attempt to determine the viability of using alpha amylase as a pain threshold indicator, alpha amylase concentrations were taken before and after an introduction to physical stress. 16 subjects ( $M= 22.13$ ,  $SD= 5.67$ ) were asked how sensitive they are to pain (high responder/low responder), and to rate the expected pain level (in response to the physical stress) on a scale from 1-10. It was found that the subject's perceived pain levels were positively correlated to the alpha amylase concentration, post-cold pressor test,  $r(14)=0.651$ ,  $p<0.01$ . These findings suggest that alpha amylase serves as a viable measure of pain sensitivity.

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**The Effects of Wave Exposure, Tidal Height, and Crowding on Cirri and Penis Morphology of the Acorn Barnacle, *Tetraclita stalactifera***

**Kevin V. Reyes**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. J. Matthew Hoch**

**Abstract**

Exposure to wave action can affect the feeding appendages (cirri) and penis morphology of intertidal barnacles. We tested several hypotheses of morphological differences in the cirri and penises of the barnacle *Tetraclita stalactifera* at different heights of the intertidal zone, on wave exposed and wave protected sites and at different levels of crowding. We sampled eight sites varying for these properties and found that barnacles from higher positions in the intertidal zone had thicker cirri than those from lower positions. In wave exposed sites, cirri were shorter and thicker than in protected sites. Increased thickness may be an adaptation to reduce risk of breakage in rough environments or in areas with stronger waves (like high positions on rocks). Longer cirri may serve as an adaptation to improve food capture in lower-flow environments. Penises from wave-exposed sites and from higher positions in the intertidal zone were thicker than those from calm areas or from low positions. Thicker penises are likely stronger and reduce the risk of breakage. None of the variables changed with crowding. Our observations of differences in cirri and penis morphology between calm and rough sites suggest that these traits (observed in several barnacle species) are adaptations shared by the species *Tetraclita stalactifera*. Our observations of differences in those traits with respect to tidal height are novel and suggest that wave action may be more intense at higher positions. This might be an interesting topic for future research in other species.



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**The Excessive Political Dominance over Doctors: How Texas' Newest Abortion Regulations Violate Women's Constitutional Rights.**

**Louize Fiore**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Vicki Toscano**

**Abstract**

Texas has enacted several new anti-abortion legislations under the false interest of regulating the medical profession while directly placing an obstacle on women's ability to obtain an abortion. The most recent illustration of this overreach is the newest Texas Health and Safety Code §171.0031, which requires that physicians have an agreement with a hospital within 30 miles of the clinic in order to have hospital admitting privileges. This statute does not provide an exemption for medical emergencies in order to preserve the patient's health or life and insures that twenty-four (24) counties in Rio Grande Valley in Texas will be left without abortion providers. Most legal scholars and courts interpret the undue burden test in *Planned Parenthood v. Casey* to prohibit state regulations that create an actual, substantial burden on women's rights to choose an abortion. Nevertheless, the United States Court of Appeal for the Fifth District departed from *Casey's* well-established legal precedent by staying the Western District of Texas' injunction relating to this unconstitutional statute. I demonstrate that the only reasonable way to understand the precedent established by *Planned Parenthood v. Casey* is that women's right to privacy supersedes a state's legitimate interest in protecting the integrity of the medical profession. The United States Court of Appeal for the Fifth District departed from this precedent and, instead, relied on the inaccurate use of the undue burden test in *Gonzales v. Carhart* as a mechanism to allow the enforcement of Texas' unconstitutional statute.

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## **The Medical Care Costs of Obesity**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Charles Harrington**  
H. Wayne Huizenga School of Business and Entrepreneurship

### **Abstract**

The rate of obesity in the United States has been increasing drastically over recent decades. Obesity is defined through the body mass index of an individual, which is equal or greater to 30.0; more than two-thirds of the population in the US is currently obese. There is an economic impact on the growing rate of obesity, with one of the main focuses in health care costs. There is a high chance of getting diseases that are linked with obesity (ex: hypertension, type 2 diabetes mellitus, and stroke). The annual medical spending for an obese individual can be six times as much as a healthy individual and can increase the overall health care costs by fifty percent. As the rate of obesity continues to escalate, taxes and premiums will increase as well. This is because a great fraction of health care costs for the obese are being paid for by the non-obese to Medicare and insurance premiums. With much research, it is evident that obesity leads to high medical care costs and a negative impact on the economy as a whole.

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**The NBA Draft: The Opportunity Costs of Early Entry**

**Tiffany Kelly**

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**Faculty Sponsor: Charles Harrington**

H. Wayne Huizenga School of Business and Entrepreneurship

**Abstract**

From 1997 to 2010, the number of basketball, collegiate athletes to declare early entry into the NBA draft has significantly increased. The National Basketball Association created a rookie pay scale in the year 1995 that established a set amount players can receive during his rookie contract based on draft position. The rookie pay scale helped all<sup>1</sup> teams to add new, unproven players at a reasonable price while keeping veteran players content with larger contracts. However, the pay scale not only created a distribution of salary, but also created more of an incentive for collegiate players to declare early entry into the draft to maximize contracts after their rookie year. From this, the number of underclassmen entering the draft spiked and the problem with athletes determining the value in his remaining collegiate eligibility intensified. This article seeks to measure and evaluate the opportunity costs in relation to contract value between the options of early entry into the NBA draft and completion of the undergraduate athletic career through marginal analysis.

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## **The Transatlantic Drug Trade: Explaining the Shift from Colombia to Venezuela**

**Carla Magno**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. G. Nelson Bass**

### **Abstract**

This project involves uncovering why Venezuela emerged as a center of drug trafficking in Latin America over the last decade. To explain this shift, I will examine the foreign policies of Venezuela, the United States, and Colombia. Specifically, this project focuses on evaluating the interactions of Venezuela with the United States, focusing on the implementation of 'Plan Colombia', which was the departing point for the increase of narcotic trafficking in Venezuela to Central America and Europe. Also, several political actions taken by the Venezuelan government in the last two decades will be taken into consideration as a possible influence. The effect of the deterioration of US-Venezuelan relations, along with the shared border with Colombia, has made easier the laundering of money on Venezuelan soil in the last decade. Therefore, this research looks to explain the shift of narcotics trafficking from Colombia to Venezuela by examining the foreign policies of the three major players in the region, and to shed light on how the international community can best address this problem.

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## **Total FMS Scores Do Not Predict Injury but Asymmetries and Low Individual Scores Do**

**Anya Ellerbroek and Stephanie Hauck**  
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Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Monique Mokha**

### **Abstract**

Functional Movement Screen (FMS) scores of <14 have been used to predict injury in athletic populations. Clinicians prioritize individual test scores of “1” and asymmetries when designing corrective exercise programs. Therefore, the presence of either of these may have more utility in predicting injury. The purpose of this study was to determine if the presence of a score of “1” or a left to right asymmetry in individual FMS tests would predict injury in collegiate athletes. 94 male and female collegiate athletes with no recent history of musculoskeletal injury performed the FMS during pre-season. Injury incidence data were tracked for an academic year by each team’s certified athletic trainer via computer software. Injury was defined as physical damage to the body secondary to physical training and where the athlete sought medical care. Total FMS scores were categorized as low (<14) or high (>14). Pearson Chi-square analyses were used to determine if (a) total FMS scores could predict injury, and (b) the presence of “1” or an asymmetry could predict injury. Athletes with FMS scores of >14 were not any more likely to sustain an injury. However, athletes with individual scores of “1” or an asymmetry were 6.8x more likely to sustain an injury. Total FMS scores could not be used to predict injury in this group. However, the presence of a score of “1” or an asymmetry in the individual tests did predict injury. Individual test scores may provide better guidance for clinicians in developing injury prevention programs.

**True Love's Sacrifice**

**Elizabeth Burbano**

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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Chetachi Egwu and Dr. Weylin Sternglanz**

**Abstract**

“True Love’s Sacrifice” is a short film about a daughter telling her parents’ romance story. Sadly, the daughter does not know her father because he died protecting her mother and, unknowingly, the daughter as well, while she was still a fetus. The daughter narrates the story of how her parents met, with an emphasis on the important moments in her parents’ relationship (for example, the first time they met, their first date, their first anniversary, her father’s proposal to her mother, and the day the father died). The film is directed by Elizabeth Burbano.

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## **Unquestionable Misogyny in the Video Game Industry**

**Christopher Rosario**

Division of Humanities  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Allison Brimmer**

### **Abstract**

Misogyny has moved from the silver screen, magazines, and internet into video gaming. The purpose of this essay is to demonstrate instances of gaming's misogynistic culture that began in the 1980's and has spiraled into the billion dollar juggernaut to this day. Countless examples of misogyny are expressed in gaming culture of the "hardcore" gaming market. Unfortunately, the gamers take their anti woman stances beyond the video games as well. When confronted about their misogynistic tendencies they attack with hateful words and pictures, and have even created a violent video game whose object is to assault a feminist blogger. Feminist bloggers, media critics, and others have been carrying the mantle against misogynistic video games for years and provide a valuable framework for this work. The paper will also explore examples of misogynistic treatment suffered by women on the business end of the gaming industry.

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## Using an Engineered Trojan Horse to Kill Nematodes

**Olena Bracho and Cyril Manchery**  
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Farquhar College of Arts and Sciences

**Faculty Sponsors: Dr. Robert P. Smith and Dr. Christopher Blanar**

### Abstract

Infections due to parasitic nematodes result in nearly 125000 deaths annually. Strikingly, this rate remains nearly unchanged in the past 50 years likely owing to the fact that treatment options are either inefficient or inaccessible. Prior to infecting humans, most parasitic nematodes begin as larvae where they feed nearly exclusively on bacteria. This unique property may offer an opportunity to develop new biological control agents with the use of synthetic biology. In this study, we aim to develop gene circuit components that may be used to engineer *Escherichia coli* to act as a biological control agent of the model nematode *Caenorhabditis elegans*. We independently characterize two genetic modules: an attraction module and a killing module. The attraction module consists of genes that produce acylhomoserine lactones, which serve as natural attractants of *C. elegans*. The killing module consists of an inducible promoter that drives the expression of a toxin gene, *cry5B*. We independently characterize the response of *C. elegans* to each of these modules towards the ultimate goal of implementing and optimizing the function of both modules together in a single strain of *E. coli*. As such, our study establishes a quantitative framework for using these modules, and ultimately engineered bacteria, as a robust biocontrol agent for nematodes.



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## **Using GIS to Create a Dental Clinic in Miami Dade and Broward County**

**Rafael L. Martinez**

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Farquhar College of Arts and Sciences

**Faculty Sponsor: Eric James Householder**

### **Abstract**

A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. The objective of this project was to create a map using GIS with enough data to help dentists to select the perfect place to create a Dental Clinic in Miami Dade and Broward County. For this map was taking into account the population of the counties in Florida, the population younger than 18 years old, and the population older than 65 years old. All of them were vector data layers downloaded through ArcGIS from ArcGIS online. To complete the project was necessary to create layers with the location of every Dental Clinic divided by specialty. It was represented in layers using vector data. To a better understanding for the users, points were used to represent every Dental Clinic depending on the specialty. This project could be used in the future in dental fields. The model of this project could work like an idea for other fields of business to help enterprises achieve their goals.

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## **You're Not as Dumb as You Think You Are: The Impact of a Metacognitive Reframing Intervention**

**Matthew Welhaf and Deborah Radmanesh**  
Division of Social and Behavioral Sciences  
Farquhar College of Arts and Sciences

**Faculty Sponsor: Dr. Jonathan B. Banks**

### **Abstract**

Working memory is the cognitive function responsible for maintaining and manipulating information. Working memory is related to other higher order cognitive abilities including, reading comprehension (Daneman and Merikle, 1996), reasoning (Kyllonen and Christal, 1990) and fluid intelligence (Conway, Kane, and Engle, 2003). Interventions designed to increase working memory are of great interest given the possible benefits in reading comprehension and academic performance. Metacognition refers to knowledge regarding one's own cognition and ability to monitor cognitive functioning (Flavell, 1979). Interventions designed to reframe metacognitive interpretations of subjective task difficulty have been shown to improve cognitive performance (Autin and Croizet, 2012). One possible reason for these cognitive performance improvements is a reduction in Task Unrelated Thoughts (TUTs). TUTs have been shown to reduce performance on a variety of cognitive functions (McVay and Kane, 2009). The current research examined the role of a metacognitive reframing intervention on individuals working memory capacity and TUTs. NSU undergraduates (N=61) completed an unsolvable anagram task and then read either a reframing or control script. Following the script, participants completed a working memory task and a metacognitive inventory. Results suggest that the intervention did not alter working memory task scores or a decrease in TUTs. However, a mediation analysis demonstrated reductions in the impact of TUTs on working memory task performance in the metacognitive reframing condition but not the control condition. These findings demonstrate that while metacognitive interventions may not reduce TUTs, they may alter the impact of TUTs on working memory task performance.

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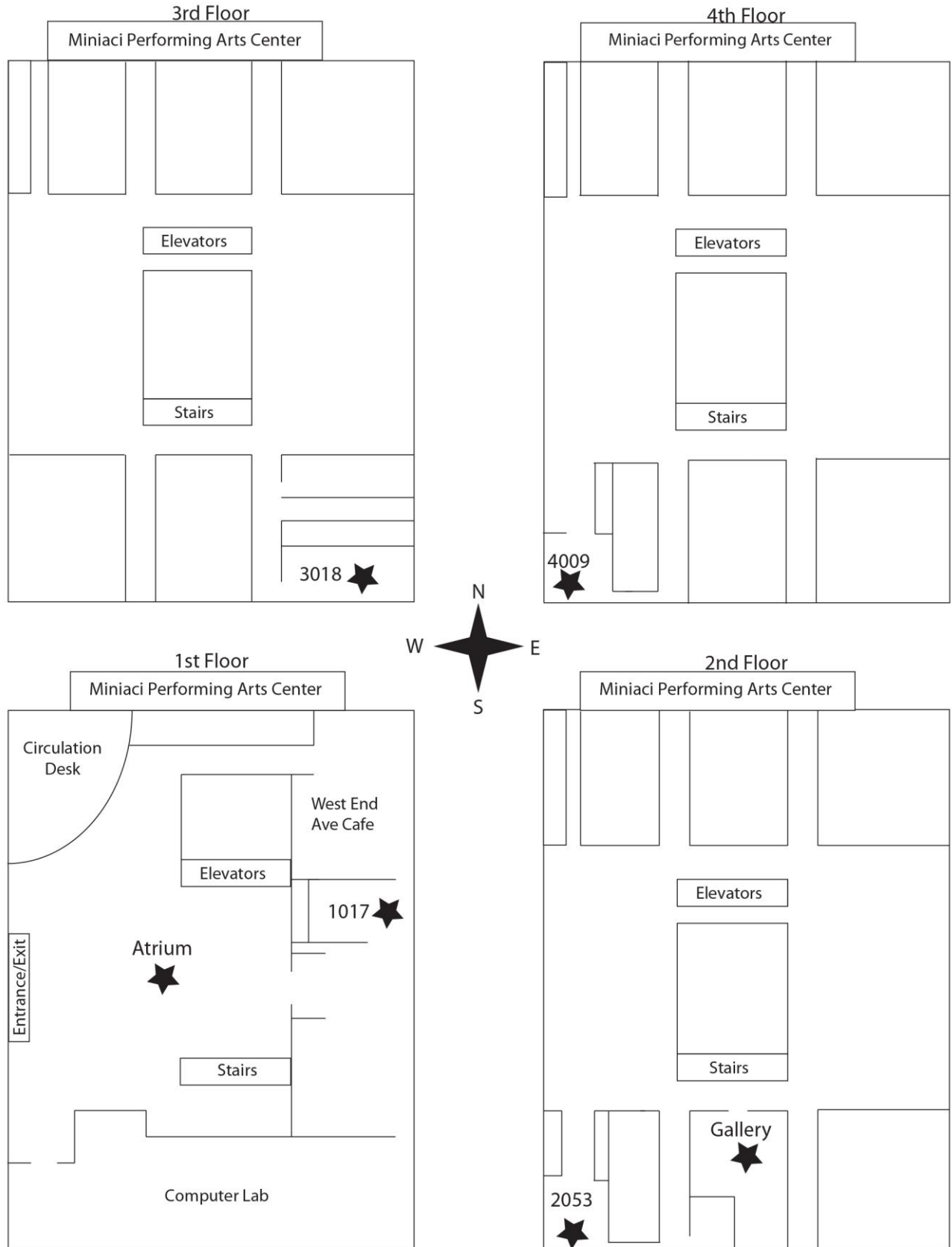
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# Undergraduate Student Symposium Presentation Locations

Alvin Sherman Library, Research, and Information Technology Center



# UNDERGRADUATE STUDENT SYMPOSIUM

## 2014 Program Schedule

TIME	EVENT AND LOCATION		
1:00 p.m. to 1:45 p.m.	<b>Welcome and Introduction</b> – Don Rosenblum, Ph.D.  <b>Keynote Speaker</b> – Jonathan B. Banks, Ph.D. – “Sliding Down the Razor Blade of Life: A journey into Research”  <b>Performance Theatre    Don Taft University Center</b>		
1:45 p.m. to 3:00 p.m.*	<b>Poster Presentations</b>	<b>First Floor Atrium</b>	<b>Alvin Sherman Library</b>
1:45 p.m. to 4:00 p.m.*	<b>Film Presentations</b>	<b>Second Floor Gallery</b>	<b>Alvin Sherman Library</b>
3:00 p.m. to 4:00 p.m.*	<b>Oral Presentations</b>	<b>Youth Program Room 1017</b>	<b>Alvin Sherman Library</b>
	<b>Oral Presentations</b>	<b>Room 2053</b>	<b>Alvin Sherman Library</b>
	<b>Oral Presentations</b>	<b>Room 3018</b>	<b>Alvin Sherman Library</b>
	<b>Oral Presentations</b>	<b>Room 4009</b>	<b>Alvin Sherman Library</b>
4:30 p.m. to 5:30 p.m.	<b>Awards Ceremony</b>	<b>Performance Theatre</b>	<b>Don Taft University Center</b>

\*See separate detailed schedule for poster easel numbers, specific film showing times, and oral presentation room assignments.