

FARQUHAR COLLEGE OF ARTS AND SCIENCES

12th Annual Undergraduate Student Symposium



Friday, April 12, 2013

Alvin Sherman Library, Research, and Information Technology Center



Undergraduate Student Symposium 2013

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 eleventh annual Undergraduate Student Symposium.

USS 2013 Keynote Speaker

Dr. Andrea E. Shaw is assistant director of the Division of Humanities and an associate professor of English at Nova Southeastern University in Ft. Lauderdale. She is a creative writer and a scholar of Caribbean and African Diaspora studies and author of *The Embodiment of Disobedience: Fat Black Women's Unruly Political Bodies*. Her creative and scholarly writing have been published in numerous journals, including *Small Axe*, *World Literature Today*, *MaComère*, *The Caribbean Writer*, *Crab Orchard Review*, *Feminist Media Studies*, and *Social Semiotics*. She graduated from the University of Miami with a Ph.D. in English and from Florida International University with an M.F.A in creative writing. She is editor of *Quadrivium: A Journal of Multidisciplinary Scholarship*, the associate managing editor of *sx salon: A Small Axe Literary Platform*, and on the editorial board of *Anthurium: A Caribbean Studies Journal*.

USS 2013 Organizing Committee

Dr. Don Rosenblum, Dr. Michael Caldwell, Dr. Tom Fagan, Dr. Matthew He, Dr. Marlisa Santos, Katie Beesting, Jeanne Hamacher

**12th Annual
Undergraduate Student Symposium**

April 12, 2013

Abstract Proceedings

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

Key Note: Dr. Andrea Shaw, Division of Humanities – “Getting Lost to Find Your Way”

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A B Cell Mediated Model of Humoral Immune System Function

Abbiana Arenas

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

Faculty Sponsor: **Dr. Evan Haskell**

Abstract

Influenza claims hundreds of thousands of lives each year world wide. Unfortunately these numbers are relatively unchanged over the past few decades. Influenza vaccines work to prime the humoral immune response for subsequent challenges by the influenza virus. With this initial priming the humoral response will produce specific and highly effective antibodies for the given virus. While effective, the mechanisms of humoral memory formation and maintenance are relatively less explored than the cell mediated response. In primary infections, the innate response and $CD8^+$ T-cells will often clear the bulk of the virus before the humoral response can produce a significant amount of antibody that we can track. In order to understand the humoral response and formation of humoral memory in primary and secondary challenges, we develop a model that tracks the response of its main components CD^+4 T-cell, B Cells, and antibodies to the infection. We model B Cell memory formation through a mechanism triggered by the CD^+4 T-Cell proliferation in order to examine conditions where memory formation is triggered. By fitting the model parameters to available data the model allows us to explore humoral system function in both normal and immune compromised systems.

A Comparative Study of the United States Response to Haiti's 2010 Earthquake and Indonesia's Indian Ocean Tsunami in 2004

Yineth Sanchez

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Timothy Dixon**

Abstract

The 2010 Haitian Earthquake resulted in approximately 220,500 casualties and 1.8 million people displaced. Similarly, the Indian Ocean Tsunami in 2004 caused catastrophic effects in the southeast region of the globe devastating more than twelve countries in less than ten minutes. In Indonesia alone, the tsunami caused 225,000 deaths and left 1.7 million individuals displaced. Both of these disasters were regarded as national emergencies for their respective countries. During the initial recovery period, Haiti and Indonesia faced serious relief challenges that led them to ask the international community for assistance. As one of the major global contributors of aid in natural disasters, the U.S. responded to both of these cataclysms. This research questioned whether U.S. involvement in one disaster was more substantial and extensive than in the other. The theory tested was that the U.S. assistance received by Haiti for the earthquake was greater than the support accepted by Indonesia. The methodology used included the review and analysis of congressional briefings and reports as well as executive department documents. The analysis of this material showed that the U.S. government offered symmetrical responses to these disasters, but the aid delivered was affected by the differing attitudes of the participants. Indonesia placed firm limitations on the delivery of international aid, while Haiti welcomed U.S. assistance without restrictions. The result was greater participation by the U.S. military in Haitian relief and additional American legislation. Thus, the U.S. support received by Haiti was more substantial and extensive than the assistance accepted by Indonesia.

A New Order in a New World: The Titan Economic Model

Linea Cutter, Nathaniel Dolan, William Kotkin, and Elizabeth Mortazavi

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsors: **Dr. Barbara Brodman, Dr. Chetachi Egwu, and Dr. Weylin Sternglanz**

Abstract

“A New Order in a New World: The Titan Economic Model” is a brief news-styled film report depicting a radical, albeit fictional, accounting of only *one* possible future-history for economic development of humanity. Speculating on the future-history of global economic structures raises noteworthy concerns while simultaneously setting the stage for rather radical new ideals.

A small group of NSU Honors students set about this very task of speculation on future-history in Dr. Brodman’s fall 2012 Honors course *History of Economic Development*. The time-frame of the film is set in December of 2012 amidst total collapse of the globalized economic structure on planet Earth after nuclear war erupted among most of the world’s developed nations. In order to escape inevitable doom, a courageous and revolutionary band of only six hundred pioneers, dedicated to beginning life anew and elsewhere under a more equitable economic model, managed to flee the global conflagration with a spacecraft, supplies, and equipment stolen from the United States arsenal at NASA and the Jet Propulsion Labs; destination – Titan – the only one of Saturn’s 62 moons known to sustain environmental conditions well-equipped to support human habitation.

This fictional film report describes in striking detail the nature of this radically new and equitable economic model and how the basic institutions therein could ultimately function for the betterment of humanity. The film was produced and directed by Linea Cutter, Nathaniel Dolan, William Kotkin, Elizabeth Mortazavi, and Amrish Ramnarine; technical direction was provided by Nathaniel Dolan; cinematography and post-production editing were provided by Amrish Ramnarine.

A Novel Method of 3D Reconstruction of Mitochondrial Morphology in Mouse Models of Alzheimer's Disease

Jonathan Romanes

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

Faculty Sponsor: **Dr. James Munoz**

Abstract

Mutations in Amyloid Precursor Protein (APP) and Presenilin 1 and 2 (PS1, PS2) proteins underlie the progression of familial Alzheimer's Disease (AD). Neurofibrillary tangles and amyloid plaques are the hallmark of AD. The disease mechanism remains elusive, however, mounting data indicate implication of mitochondrial dysfunction and energetic stress early in disease progression. We have previously demonstrated that loss of mitochondrial motility observed in embryonic neurons from APP/PS1 and PS1 transgenic mice was among the earliest abnormalities detected in these animals prior to the loss of mitochondrial function, the onset of memory or neurological phenotype or deposition of amyloid plaques. These structures were most likely associated with altered mitochondrial fission or fusion. This study is designed to reveal the details of morphological changes of mitochondria using 3D reconstruction of serial sections obtained with transmission electron microscopy (TEM). We aimed to quantify the specific changes in mitochondrial shape, length, width, formation of abnormal structures, distribution, and cristae organization in young (20 weeks) and old (52-54 weeks) NTG and APP/PS1 throughout the CA1 & CA3 regions of the hippocampus. Defining the mechanism underlying changes in mitochondria morphology in FAD mice could help to understand the disease mechanism and suggest therapeutic interventions.

A Social Interaction Model for the Formation of Local Hotspots of Criminal Activity

Dean Gardner

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

Faculty Sponsor: **Dr. Evan Haskell**

Abstract

Areas of highly concentrated criminal activity, or hotspots, are a key concern of law enforcement agencies. A large portion of criminal offenses are committed in a relatively small number of these stable zones. We develop a model to study the mechanisms that lead to the formation of these hotspots. In particular we incorporate the contribution of social interactions to the dynamics of the propensity for a criminal agent to act. Hotspots manifest as a form of equilibrium solution of this model. We develop taxonomy of equilibrium solutions based upon the parameters of the model. We explore effectiveness of various strategies for deterring the formation of persistent hotspots. Additionally, we examine the interaction of multiple hotspots.

Agonism in Marine Fish Species

Kory Evans

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

Faculty Sponsor: **Dr. Paul Arena**

Abstract

The purpose of this experiment was to observe agonistic interactions between juvenile members of the families Haemulidae and Lutjanidae. Both families are salt water fishes whose habitats and diets frequently overlap. Lutjanidae, commonly referred to as snappers, are a critically important commercial and recreational species that are sought after by fishermen worldwide. It is this fishing pressure that is most likely responsible for the decline in global snapper populations

Traditionally, grunt (Haemulidae) are more abundant than snapper, and it is not entirely understood why. There are notable differences in the behavior of the juvenile members of these two families, with haemulids preferring a more social life style while lutjanids prefer a solitary lifestyle. The driving question for this study is whether or not behavior-driven bottom up controls at the juvenile life stage have an influence on adult snapper populations. As juveniles, both, lutjanids and haemulids are plentiful, and found commonly in mangrove areas and shallow reefs. However, as they mature, a notable decline in the snapper population has been observed. It is theorized that selective fishing pressures have a large effect on the declining population; however, it is possible that the early juvenile competition between lutjanids and haemulids may also have an effect on the lower population numbers of lutjanids.

In a preliminary study, it was found that juvenile lutjanids are on average, more aggressive than their haemulid counterparts demonstrating several occurrences of territorial displays and other agonistic behaviors.

Anticancer Effects of Pumpkin Seed Extracts on LNCaP Prostate Cancer Cell Line

Rajeswari Murugan, Jackie Lynne Jornadal, and Yanira Quinonez

Division of Math, Science, and Technology

Farquhar College of Arts and Sciences

Faculty Sponsors: **Dr. Appu Rathinavelu and Dr. Mark Jaffe**

Abstract

Clinical research has shown that Pumpkin seed (PS) is effective in treating various conditions including benign prostatic hyperplasia, inflammatory prostatitis, and prostatic secretion. However, there is insufficient scientific data available regarding the cytotoxic effects of PS on prostate cancer cells. Thus, the purpose of this study was to evaluate the cytotoxic effects of both aqueous and alcohol extracts of PS on the LNCaP prostate cancer cell line and elucidate the possible mechanisms involved in mediating these effects. During the study, LNCaP cells were treated separately with aqueous and ethanolic extracts of PS (50-200 $\mu\text{g/ml}$ concentrations). After 24 hours of treatment, cell viability was evaluated using the trypan blue dye exclusion method. Both extracts produced significant cytotoxic effects on LNCaP cells causing reductions in the viability. Subsequently, ROS (reactive oxygen species) levels, mitochondrial membrane potential and DNA fragmentation were measured in these cells. PARP (Poly-ADP-Ribose Polymerase) cleavage was examined to assess its role in PS induced apoptotic events in the LNCaP cells. As anticipated, both extracts triggered the apoptotic cascade by increasing the levels of ROS, reducing the mitochondrial membrane potential, and causing DNA fragmentation. The results suggest that the cytotoxic effects of PS extracts on LNCaP cells could be mediated via activation of the intrinsic pathway that ends with DNA fragmentation and apoptosis. The PARP cleavage results with extracts indicate that aqueous extract may be stronger in causing apoptosis cleavage than the alcohol extract. [This research project was supported by the Royal Dames of Cancer Research, Inc., Ft. Lauderdale, FL]

Apoptotic Effect of Lithocholic Acid on LNCaP Prostate Cancer Cell Line

Shivali Patel and Nikki Joseph

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

Faculty Sponsors: **Dr. Appu Rathinavelu, Dr. Deanne Roopnarine,
and Dr. Sivanesan Dhandayuthapani**

Abstract

Lithocholic acid (LCA), CHO is a bile acid naturally produced in the liver that helps to digest fats. LCA has been reported to produce cytotoxic effects on cancer cells while leaving healthy cells unharmed. Recently, based on previous studies conducted, an apoptotic mechanism was proposed for LCA in neuroblastoma (NB) cells, rat glioma cells and breast cancer cells. Therefore, the main purpose of this experiment was to confirm the apoptosis inducing mechanisms of LCA in LNCaP prostate cancer cells. In addition, a combination of LCA and topotecan (TPT), a chemotherapeutic drug, was used to evaluate its potency as well. The effects of LCA were measured through induction of cytotoxicity, DNA fragmentation, caspase-3 and caspase-9 activity, PARP cleavage, and Western blotting. The results obtained from each experiment confirmed the initial hypothesis of the apoptotic effect of LCA on LNCaP cancer cells. Lithocholic acid alone has shown greater oncolytic potential than the combination tested. (The authors would like to thank Royal Dames of Cancer Research Inc, Ft. Lauderdale)

Applications of Abstract Algebra to Puzzle Modeling

Sharbel Bousemaan

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Ricardo Carrera**

Abstract

Abstract Algebra is an area of mathematics which focuses on the properties of algebraic structures. One such structure, called a Group, has properties which are applicable to puzzle solving. We provide the fundamental properties of permutation groups and discuss certain theorems which enable one to model a variety of puzzles. In addition, we demonstrate how the computational algebra program, GAP can be utilized in order to work with the large permutation groups that describe very complex puzzles. Our goal is to use the mathematics underlying these puzzles in order to understand how they can be solved.

Are Working Memory and Response Inhibition Correlated with Executive Function?

Laurie Cruz, Lauren Adames, Katie Dabrowski, and Shannon Dugan

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

Faculty Sponsor: **Dr. Leanne Boucher**

Abstract

Common ailments such as dementia and attention deficit disorders show a decrease in the individual's ability to perform tasks that utilize executive functioning. To measure executive functioning, we focus on two important components: working memory and response inhibition. Working memory measures the ability to handle multiple tasks at once and has been correlated with IQ. Response inhibition is the ability to stop an ongoing response. There is a debate about whether response inhibition and working memory are separate or overlapping functions when performing cognitive tasks. The stop-signal task was used to measure response inhibition under two conditions of high or low working memory load. The two loads were used to assess the independence between working memory and response inhibition. If working memory and response inhibition are independent, working memory load should not interfere with response inhibition. We found partial independence between working memory and response inhibition. We also measured working memory capacity. We hypothesized that individual differences such as multi-lingualism, video gaming, and athleticism will positively correlate with working memory capacity. The results show a trend that the participants in these categories are more likely to have higher scores than other participants. Findings from the present study can also provide information regarding a possible relationship between working memory and response inhibition, as well as suggest cognitive benefits of multi-lingualism, video gaming, and athletics.

Barcoding of the COX-1 Region in *Lagenidium giganteum* DNA

Joshua Mathews

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

Faculty Sponsor: **Dr. Aurelien Tartar**

Abstract

The oomycete, *Lagenidium giganteum*, is a parasitic microbial pathogen that infects the larvae of mosquitos. Their presence can dramatically reduce the population of mosquitoes in a given area as the parasite reproduces quickly and kills many of the mosquitoes before they reach adulthood. The control of the population of mosquitoes is desirable considering the possible pathogens that the mosquitoes carry like West Nile Virus and Malaria which can infect humans and lead to death if untreated. The main purpose of this study is to barcode the Cytochrome *c* oxidase subunit1 (COX 1) region of the mitochondrial DNA in *Lagenidium giganteum* in order to properly identify the species of oomycete and provide information for the detection of oomycetes. Barcoding of the COX1 region is advantageous because it is a protein coding area that is less likely to be altered by insertions, deletions, or mutations in its sequence and thus provides a stable area for identification purposes that are specific to a species. Our objective is to determine the correlation between *Lagenidium* populations and mosquito populations and eventually develop *Lagenidium* into an effective insecticide. In the fall of 2012, we used Polymerase Chain Reaction and Gel Electrophoresis techniques to amplify and sequence the COX-1 gene in *Lagenidium*. In the winter of 2013, we designed a second set of COX 1 primers that were specific to *Lagenidium* to detect *Lagenidium* in the environment. The purpose of this was to determine its abundance and impact on mosquito populations.

**Belief in Paranormal Prophecies: Motivated by Narcissism, the Need for Meaning,
or Self-focused Sensation Seeking**

Laurie Cruz, Scott Earley, and Alex Pop
Division of Social and Behavioral Sciences
Farquhar College of Arts and Sciences

Faculty Sponsors: **Dr. Jason Piccone and Dr. Glenn Scheyd**

Abstract

Many Americans believe in paranormal phenomena despite a lack of credible evidence. The acceptance of systems such as astrology and numerology can leave people vulnerable to financial and emotional exploitation. This study explores personality variables associated with the acceptance of personal information generated by a scientific or astrological system. Participants were randomly assigned to receive either a positive or negative personal statement, generated from either a scientific or an astrological source. The following hypotheses were tested: positive statements would be accepted more than negative statements, participants who exhibit subclinical narcissism will more strongly reject negative statements and will more strongly accept positive statements, participants searching for a purpose in life will be more accepting of astrological statements, and individuals who score high on sensation seeking will be more likely to accept any of the statements regardless of their source. The results of this study should shed insight into a pattern of irrational thinking and may educate people on how to avoid common fallacies.

Biomechanics, Design, and Fitting of Prosthetics and Orthotics

Alan Nguyen

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

Faculty Sponsor: **Dr. James Munoz**

Abstract

The proposed independent study was in conjunction with the biomedical engineering students on the Mercer on Mission team at Mercer University. The course had two settings. The clinical training and manufacturing of prostheses took place in a class and laboratory setting in the biomedical engineering department at Mercer University. A portion of the class was dedicated to learning basic Vietnamese to help overcome language barriers. The application of said training took place in various clinics in poor and rural areas of Vietnam, specifically Vinh Long Middle School, Dong Thap Community Medical Clinic, Dat Do County Community Medical Clinic, and Long Dien Community Medical Clinic. The purpose of this program was to provide medical aid to poor communities in Vietnam. A large portion of the program focused on manufacturing and fitting cost-efficient prosthetics and orthotics for individuals with deformities and those with above- and below-knee amputations. The other part of this program focused more on the medical side of the mission. Students learned to diagnose various musculoskeletal conditions that plague malnourished and overworked manual laborers, learned about and prescribed physical therapy to treat patients' conditions and alleviate symptoms, and administered vitamins to malnourished patients via intramuscular injections. Students also operated the check-in station and learn to perform interviews for patients' medical histories.

Communication Trends in the Pathographies of Leiomyosarcoma Patients

Samuel Falk

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Edwin Stieve**

Abstract

Historically, the term pathography has been interpreted exclusively as written, printed narratives of illness in Hawkins, *Reconstructing Illness: Studies in Pathography* (1999). Since this publication, the digital age has emerged and new forms of media have become standard tools for communication. Thus, this research expands on the term pathography to include current technological forms of communication as well as printed texts. It explores the recurring trends that comprise Leiomyosarcoma (LMS) pathographies, while incorporating interpretive models from various communication theories as they apply to patients' communication strategies. These theories help to unravel the connotative meaning of LMS patient narratives, which include patients' fears, emotional support, alternative approaches, medical findings, and other various trends. This research explains how patients diagnosed with rare illnesses, such as LMS use current technology to communicate information throughout the globe, as well as make sense of their illness through various media. In addition, this research explores the notion that medicine involves more than orthodox scientific practices and standard treatment options. Seen holistically, illness involves a complex scope of a patient's daily life, which includes different forms of communication. The background for this research derives from academic journals, peer-reviewed articles, internet sites (blogs, social networking, emails, wikis, etc.), in print texts, and in person (interviews) sources.

**Discovery of a Branching Coral (*Pocillopora damicornis*) Aggregation in
Concha y Perla Lagoon, Galápagos Islands, Ecuador**

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

Faculty Sponsor: **Dr. Joshua Feingold**

Abstract

Aggregations of the branching reef-building coral *Pocillopora damicornis*, located in the Concha y Perla lagoon on Isabela Island, Galapagos Islands, Ecuador, were surveyed in the summer of 2012. This undescribed *Pocillopora* community is now unique in the archipelago since all other *Pocillopora* accumulations have been destroyed due to impacts associated with El Niño – Southern Oscillation events. One hundred twenty-two photographic images were taken of the colonies that included approximately 95% of the total coral area. These images were analyzed using CPCe software for live and dead tissue areas as well as colony fragments. Within the surveyed area there were 579 colonies, and a total of 16.1 m² of live coral tissue within 76 m² of total image area. Of the total colony surface area, 85.2% was live tissue, with 12.1% being dead skeleton and 1.2% fragments. Average colony size was 326 cm². This community is of particular ecological value due to its unique presence in the archipelago and support of associated organisms such as fish and benthic invertebrates. Its proximity to the population center of Puerto Villamil gives this ecological oasis high touristic appeal and consequently high economic value.

Environmental Enrichment and Stereotypical Behavior in North American River Otters

Carolina Segarra

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

Faculty Sponsor: **Dr. Paul Baldauf**

Abstract

The goal of this study was to determine factors governing stereotypic behaviors of North American river otters on display at the Palm Beach Zoo. Stereotypic behaviors in captivity occur for no apparent reason, are repetitive and at times may cause harm. Zookeepers strive to provide challenging environments, objects, and activities (enrichments), whether physical, social or mental, to prevent or eliminate stereotypic behaviors and to encourage natural behaviors crucial to animal welfare. For this study, three otters (1 male, 2 females) were chosen based on their consistent stereotypic behaviors. We collected data following an ethogram designed around the natural history of this species and took into account the time of day, number of guests, style of habitat, and type of enrichment provided. Each otter was observed from outside the enclosure for 15 minutes, three times a day and twice a week for a total of eight weeks (720 minutes total). Observations were divided evenly between terrestrial and aquatic habitats, and new and old enrichments. Analysis of these observations showed stereotypic behaviors correlated strongly with smaller audiences, older enrichments and early hours of the day, although the male demonstrated stereotypical behavior more often during new enrichments. No differences were observed between the different styles of habitat. The results of this study will help zookeepers at this and other institutions identify factors that increase or decrease abnormal behaviors in captive animals. Thus, if stereotypic behaviors occur more often when older enrichments are present, then new enrichments should be used to reduce abnormal behavior.

Evaluating the Impact of Cruise Ship Emissions on the Air Quality in South Florida

Aarabhi Rajagopal

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Faculty Sponsor: **Dr. Song Gao**

Abstract

South Florida enjoys the reputation of being the cruise capital of the world, for it has two of the busiest cruise ports in Miami and Fort Lauderdale, respectively. Cruise ships, while bringing tremendous recreational pleasure, emit substantial quantities of gases, such as nitrogen dioxide, and aerosols that pose health risks for the public, especially to those in the elder and sensitive groups. This study attempts to understand the impact of ship emissions on the regional air quality in South Florida. Specifically, the distributions of high and low cruise seasons, as well as heavy and light emission days, are assessed based on cruise port schedules. The levels of key air pollutants, which are obtained from air monitoring databases, appear to display some associations with the cruise seasons and the ship emission amounts. Wind analysis demonstrates the impact of ship emissions relative to other emission sources, such as automobiles. These patterns are compared with those in other regions with cruise ports. The possibility of ship emissions causing public health concerns in South Florida is also discussed.

Evaluation of Injury Risk in Collegiate Athletes Using the Functional Movement Screen™

Isaac Pardo and Lorena Platero
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Faculty Sponsor: **Dr. Monique Mokha**

Abstract

Total scores of ≤ 14 on the Functional Movement Screen™ (FMS) have been associated with injury risk in firefighters, professional football players and female collegiate athletes. Seven movement patterns (e.g. squat, inline lunge, etc.) comprise the FMS, which are scored individually from 0 to 3, and added together for a total score. The purpose of this study was to examine injury risk in 4 groups of intercollegiate athletes, female rowers (ROW), female soccer (WSOC), male soccer (MSOC), and female volleyball players (VB) using total and individual test FMS scores. Samples of convenience were used; 27 ROW, 29 WSOC, 27 MSOC, 17 VB ages 17-22, with no recent musculoskeletal injury performed the FMS. ANOVA and Kruskal-Wallis examined mean differences in total scores between teams and the individual test scores between teams, $p < .05$. Total scores were similar, 15.86 ± 2.07 (ROW), 15.83 ± 1.91 (WSOC), 15.59 ± 2.02 (MSOC), and 15.40 ± 1.84 . 7 ROW (26%), 9 WSOC (31%), 7 MSOC (26%), and 5 VB (33%) had total scores of ≤ 14 . Individual scores for all tests were similar except trunk stability push-up (ROW 2.11 ± 0.89 , WSOC 2.07 ± 0.80 , MSOC 2.67 ± 0.48 , VB 1.60 ± 0.83 ; $p = .001$) and rotary instability (ROW 2.33 ± 0.48 ; WSOC 2.10 ± 0.31 ; MSOC 2.11 ± 0.32 , VB 2.07 ± 0.26 ; $p = 0.047$). Teams had similar total FMS scores. However, a greater percentage of VB and WSOC were at risk for injury. Results can be used to prescribe injury prevention exercises.

Exploring Mutagenic Effects of Atmospheric Aerosol Components

Patrick Doty, Arti Patel, and Diyva Pandya

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Song Gao and Dr. Robert Smith**

Abstract

Atmospheric aerosols play key roles in global climate, air quality and public health issues. In the latter case, it has been shown that aerosols may exacerbate pulmonary and cardiovascular symptoms or diseases, via pathways such as oxidative stress. However, neither the detailed aerosol composition nor how aerosols may generate certain biological responses, including human health risks, is fully understood. This study explores how several important organic aerosol components such as polyaromatic hydrocarbons (PAH) may generate mutagenic effects in *Escherichia coli*, using a standard mutagenicity assay. Variables such as the PAH type and temperature are tested and preliminary results will be reported. Both standard compounds and aerosol samples are examined for any such effects. The implications of aerosols for a number of environmental as well as evolutionary processes will be discussed

Expression Levels of Various Proteins in Wild-type and Transfected LNCaP Prostate Cancer Cells

Rebecca Zeller

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Appu Rathinavelu and Dr. Mark Jaffe**

Abstract

The MDM2 oncogene has become one of the major fields of cancer research since this oncogenic protein is expressed in several common human cancers including prostate cancer. MDM2 interacts with many proteins in the cells such as p53 and leads to over expression of PI3K, HIF-1 α , VEGF. Hence exploring the role of alterations associated with these genes at the transcription level has become a major part of our prostate cancer research. LNCaP cells that have been transfected (LNCaP-MSI) with a gene silencer specific for MDM2 was speculated to become a good model for some of our advanced studies in prostate cancer. The LNCaP-MSI prostate cancer cells were tested by comparing to normal LNCaP prostate cancer cells and LNCaP-MST (MDM2 transfected) cancer cells to see whether MDM2 silencing had any impact on the expression of PI3K, HIF-1 α and VEGF. The results of our experiments with LNCaP-MST cells have offered some valuable information. (This project was supported by Royal Dames of Cancer Research Inc, Ft. Lauderdale, Florida)

Feminist Activism: Using Technology to Raise Awareness about Domestic Violence

Nadine Grifoni and Morgan Sanchez

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Kelly Concannon Mannise**

Abstract

Our project will visually represent a community-based study we conducted on domestic violence and its relationship to college students. In this poster presentation, we will assess the relationships between sites of activism for college students, as well as the effectiveness of community resources for survivors of dating and domestic violence. We will reflect on two parts of our research: firsthand experience at a College Bride's Walk (a community-based initiative to create solidarity amongst neighboring university institutions) and interviews with domestic violence survivors at a local domestic violence shelter.

Our purpose will be to use our primary research to engage in feminist activism at Nova Southeastern University, as oftentimes traditional methods for bringing awareness about these issues (displaying flyers, organizing walks) isn't enough to engage students. Therefore, we will argue that proactive steps need to be implemented (blogging, networking). We will create a "Tumblr" post on the internet regarding domestic violence and abuse. It can be difficult to engage young minds; however, if the information is presented in ways that they can relate to, more can be done to better the community. The popular blog and social networking website 'Tumblr' is a perfect example of how knowledge and information is spread. Combining efforts, we hope to make a revamped, 21st century change to the way college students look at domestic violence, as it is a serious issue that drastically affects them as it is ranked one of the highest potential dangers students may experience (*Supreme Ct. of California*, 2013).

‘Ferling,’ the Brightest City Light

Sasha Strelitz

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Faculty Sponsor: **Dr. Lynn Wolf**

Abstract

Lawrence Ferlinghetti, owner of the famed City Lights Bookstore, is not only considered as the premiere publisher of Beat literature, but he is also an accomplished Beat writer himself. This project will explore the fact that Ferlinghetti’s works mirror themes and stylistic nuances typical of the literature of the Beat Generation. These include: Eastern religious influences, a modernist American perspective, creatively unique poetic alignment, elements of jazz composition and drug experimentation that Beatniks are notorious for, and lastly, methodology that is visibly a legacy of Walt Whitman – for instance, cataloging, eclectic internal rhyme, and a like-minded, all-encompassing moral consciousness. Such Beat-like literary qualities are illustrated by a close analysis of Ferlinghetti’s poems, such as “Baseball Canto,” “Ladakh Buddhes Biker,” and “A River Still to Be Found.” Like other Beat poems, these are earnest attempts to mythologize modern America. This project will culminate with a short analysis of Ferlinghetti’s “Work-in-Progress,” which memorializes his fellow Beatnik compadres by poetically mythologizing them. This project compares the City Lights publisher’s works with those of more well-known Beatniks to verify that while Lawrence Ferlinghetti published some of the most recognized Beat works, he also wrote some illustrious Beat poetry of his own.

Gene Evolution and Conservation in Marine Sponges

Bryce Parrish

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Faculty Sponsor: **Dr. Jose Lopez**

Abstract

The phylum Porifera makes up the foundation of the tree of life for all eukaryotes. Conducting bioinformatics studies on sponge gene sequences will be important for discovering sponge phylogenetic markers within the Phylum. This could be important for finding and tracking genes that could potentially be used as evolutionary markers within Porifera. This study will utilize previously sequenced cDNA transcripts of two sponge species, *Cinachyrella alloclada* and *Discodermia dissoluta*. We searched for gene sequences that had interesting metabolic functions and, conserved motifs within these two species. Gene sequence identities were verified with BLAST searches. Next, I performed in silico translation with an online ExPasy tool to get the protein sequences. I then performed sequence alignments of target proteins to discover alignments that would allow for the design of PCR primers that I will test on various sponge samples that were harvested locally. The purpose of this experiment is to create PCR primers that could be used to extract D. N. A sequences from sponges. Some specific genes that we targeted in this experiment are RAB30, e3 subunit of the ubiquitin protein complex, fibrinogen complex –A, cytochrome p450, and mucin-4 like. Also, the function of Rab 30 protein has been studied in mammals and, it is found to be tightly associated with the Golgi Complex. Its function is thought to aid in the structure and, maintaining the integrity of the golgi complex. Rab 30 protein is in the super family of GTPases and are involved in vesicle formation and trans-membrane trafficking.

Halo or Noose?

Arielle Mejia-Garcia

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Faculty Sponsor: **Dr. Lynn Wolf**

Abstract

This paper analyzes Coventry Patmore's "The Angel in the House," John Ruskin's "Of Queens' Gardens," and Virginia Woolf's "Professions for Women." The role of women in the Victorian age was a major issue of dissention which inspired many literary works reflecting divergent viewpoints. The expectations of women are very clearly defined in Ruskin's essay "Of Queens' Gardens," in which he discusses the specific differences and varying capabilities of men and women. Patmore's poem "The Angel in the House" epitomizes the "ideal" woman and wife, portraying the oppressive standards inflicted upon women of that era. Virginia Woolf's essay, "Professions for Women," directly criticizes Patmore's "angel" for its patronizing outlook toward women. The goal of this analysis is to show the varying perspectives on the female situation in the 19th and 20th centuries.

Happy Me

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Farquhar College of Arts and Sciences

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

Abstract

“Happy Me” is a short documentary film about the lives of four different homosexual students – specifically, how they dealt with their various situations in the past, and how they adapt to life now as college students. The film takes an intimate look at what these people decide to share, and how they are “Happy” as themselves. The film is directed by Miranda Schumes and Malischa Oge.

Histological Techniques Investigating the Occurrence of Metaplasia in *Crassostrea virginica*

Rina Bhalani and Timothy Chung

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Faculty Sponsor: **Dr. Deanne Roopnarine**

Abstract

The Macondo oil spill occurred in Louisiana bay in 2010. It was caused by the explosion of the *Deepwater Horizon* oil rig. Approximately 4.9 million barrels of oil were spilled into the waters of the Gulf of Mexico. Although immediate environmental effects were easily observed, studies are now underway investigating the long- term effects of the disaster. This study focuses on the effects on shellfish, in particular the Eastern oyster *Crassostrea virginica*. It is hypothesized that oysters might have undergone metaplasia in their gills. Metaplasia is the replacement of one cell type with another. Since oysters are filter feeders, their gills are composed of ciliated simple columnar epithelium for this purpose. Oysters collected from Barataria Bay, Louisiana after the oil spill were studied with Chesapeake oysters as a control. The primary method of investigation was histological technique. To date, post-spill specimens from Louisiana have shown a combination of normal simple columnar epithelium along with stratified squamous epithelium. Further investigation is necessary to determine if these results are widespread.

How Quorum-Sensing Based Synthetic Circuits Have Revolutionized Our Understanding of Evolutionary Dynamics

Lauren Boudreau

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Robert Smith**

Abstract

Synthetic biology uses gene circuits to explore and answer fundamental questions in biology. A gene circuit consists of a rationally engineered series of genetic elements all of which interact leading to a novel behavior in a cell. One genetic element that has revolutionized our ability to control cell behavior is quorum sensing, defined as the ability of cells to communicate using small diffusible molecules. Implementation of genetic elements that allow quorum sensing has led to the engineering of gene circuits that have addressed important evolutionary questions in areas such as altruistic cell death, predator-prey growth dynamics, the evolutionary benefits of quorum sensing and the formation of bacterial biofilms. In this book chapter (to be published in in “The Physics of Signaling and Communication in Bacteria”), we review the construction and implementation of various circuits containing quorum sensing elements, discuss how the insight gained from these circuits has significantly advanced our understanding of biology and we hypothesize how such circuits may lead to broad applications in medicine.

Implicit Attitudes Toward Gay Adoption Through Public Policy Recommendations

Scott Early

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Faculty Sponsor: **Dr. Glenn Scheyd**

Abstract

In the current study, we sought to measure people's implicit attitudes towards gay adoption. As of today, the review of the scientific literature has revealed little to no effect of parents' sexual orientation on the long-term psychological well-being of their adoptive children. The belief that straight couples are much better at raising children is therefore likely to be derived from ideology rather than the best available evidence. We investigated people's feelings on gay adoption. To minimize social desirability bias in participants' response, the purpose of the study was obscured by distractor questions about other public policy issues and by using a between subjects experimental design. That is, each participant respond to only one form of the target question. Half of the participants were asked "If people who were raised in an adoptive family by straight parents are found to have an 18% higher rate of suicide than those who were raised in an adoptive family by gay parents...." For the other half, gay and straight were switched. We included measures of political ideology, which enable us to examine if heterosexist bias exists even among those who identify themselves as socially liberal. We hypothesized that participants assigned to the condition of the gay parents question would endorse more restrictions on parents' adoptive rights.

Increasing Crop Yield by Stimulating Bacterial Respiration with Agricom, an Agricultural Stimulant

Noemi Bermudez and Faria Fatmi
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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Joshua Loomis**

Abstract

Nitrogen fixation is an essential process by which plants take in nitrogen from the atmosphere and convert it into usable inorganic nutrients. More than ninety-percent of all nitrogen fixation is carried out by nitrogen-fixing bacteria; therefore, it is hypothesized that increasing the growth of N_2 fixing bacteria will ultimately increase the rate of plant development. The purpose of the first part of the experiment was to determine the appropriate concentrations of the active ingredients that constitute the proprietary, commercial growth stimulant (Agricom) that optimized bacterial respiration. A respirometer was utilized to measure bacterial respiration, which indicates levels of bacterial metabolism and population density. It was shown that the selected Agricom solution increased bacterial respiration as compared to the control. The Agricom solution was then utilized in the second part of the experiment to test how it affected the growth of mung bean sprouts. Six groups of twenty mung beans each were subjected to different conditions as follows: water only, Agricom only, fertilizer only, fertilizer and Agricom, fertilizer and N_2 fixing bacteria, and all three (fertilizer, bacteria, and Agricom). The results are currently being concluded.

Individual Differences in Working Memory Capacity and Eyewitness Identification

Rachel Berger

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Faculty Sponsors: **Dr. W. Matthew Collins and Dr. Jonathan Banks**

Abstract

A number of studies have examined the association between individual differences in working memory capacity and the production of false memories. However, the relationship between individual differences in working memory capacity and the ability to accurately identify a perpetrator out of a lineup has never been studied. The current study measures participants' working memory capacity, sustained attention, and speed of processing in order to determine if it has an effect on people's ability to identify a man out of a lineup. In the study, participants are placed in either a "warning" or "no warning" condition before watching a short video. Participants in the warning condition are explicitly told that they will need to identify the man in the video at a later point in the study. Participants in the no warning condition are simply told to watch the video in order to comment on its artistic appeal. After watching the video, participants' working memory capacity is assessed using an AOSPAN task. The participants are then asked to identify the man they saw in the video in a simultaneous lineup. Finally, participants' speed of processing and sustained attention is measured using a pattern comparison and SART task, respectively.

Individual FMSTM Tests Differ Between Collegiate Women Rowers and Soccer Players Despite Similar Total Scores

Lorena Platero and Isaac Pardo
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Faculty Sponsor: **Dr. Monique Mokha**

Abstract

Total scores of ≤ 14 on the Functional Movement ScreenTM (FMS) have been associated with injury risk in athletes and healthy adults. The 7 individual tests comprising the FMS (deep squat, inline lunge, hurdle step, shoulder mobility, trunk stability push-up, active straight leg raise, and rotary stability) are scored from 0 to 3, and provide information on movement pattern performance that can be used to program corrective exercises. The purpose of the study was to examine total and individual test scores between intercollegiate rowers (ROW) and soccer players (SOC). Samples of convenience were utilized; 56 female participants (27 ROW, 29 SOC), aged 17-22, with no recent history of musculoskeletal injury performed the FMS according to protocol. An independent T-test and Mann-Whitney U test were used to examine mean differences in total and individual scores, respectively. Mean total FMS scores were 15.86 ± 2.07 and 15.83 ± 1.91 for the ROW and SOC, respectively. 7 ROW (26%) and 9 SOC (31%) had total scores of ≤ 14 . Scores were similar, $p \geq .05$, for all 7 individual tests except rotary instability (ROW 2.33 ± 0.48 ; SOC 2.10 ± 0.31 ; $p = 0.38$). We conclude that ROW and SOC performed similarly on the FMSTM. However, more individual SOC were at risk for injury and scored lower on the rotary instability test indicating more a deeper dysfunction in reflex stabilization of the core musculature.

Landslide Hazards Mapping, Badlands National Park, South Dakota: Applications in GIS

Shari Blaker

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Paul Baldauf**

Abstract

The goal of this project is to create an interactive hazards map that can be rapidly updated, and used to analyze emerging landslide hazards in Badlands National Park, South Dakota. Digital map technology is a dramatic improvement on the analytical and predictive power of traditional paper maps, allowing us to integrate photographs, digital maps, investigator data and commentary with GIS modeling and analysis. We believe that the Norbeck Ridge Slide, which is approximately 814 meters and is adjacent to State Route 240, the main road into the Badlands National Park, is an intermittently active, slump-induced slide with destructive potential. Ephemeral sag ponds observed at the head of the Norbeck Ridge Slide, along with gentle southward dipping strata and vertical jointing, could create conditions conducive to reactivation of slumping. Conditions at the slide that contribute to possible reactivation include flooding and unstable fault lines. As part of this project, we created a digital base map of Badlands National Park on ESRI's ArcGIS using data gathered with Trimble and Garmin GPS units, field notes and photographs at specific landslide locations. Using field data, we created a geodatabase and rectified those data on high resolution Bing imagery. We analyzed the composite map to create distinct spatial and temporal boundaries based on geologic beds and historic activity. Here we present our results using ArcGIS, a topographic map, and Global Positioning System units showing that we were successful in creating a GIS digital map showing the landslide activity in Badlands National Park.

Lord British is Dead: An Analysis of the Execution and Consequences of Emergent Gameplay within Massively Multiplayer Online Video-Game Communities

Joseph Cirino

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Faculty Sponsor: **Dr. Eric Mason**

Abstract

It is a common perception that video-games contain rules and restrictions that force players to react in specific ways to a variety of situations. The milieu of games are rightfully believed to put a limit on player responses as intended by the developers of such games, for video-games are simply graphical representations of programmed environments. While video-games provide an accepted form of social interaction and traditional problem-solving based on pre-created environments of game design, it also creates unprecedented opportunities for players to create revolutionary new forms of play that are not expected by the developers of the game.

The patterns of this "emergent gameplay", while new and interesting, also provide an evolving view into the workings of human ways of creating new techniques to achieve goals. Often times these practices put into action by players combine a style of gameplay and meta-gaming that is never intended by the developers of the game, but quickly comes into its own as a valid strategy used by a game's community.

This paper will attempt to analyze the factors and situations necessary for the successful execution of emergent gameplay within a variety of massively multiplayer online video-games over the course of many decades of gaming. By touching on different types of emergent gameplay that is seen within these vast communities of players, the factors that lead up to the execution and later consequences of a human group acting towards a novel and unexpected solution within a restricted system of actions will become clear.

Madness: Sense, Consequence, and Freedom

Melissa Villalobos

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Kathleen Waites**

Abstract

This essay analyzes the shared plight of Bertha Mason, from Charlotte Brontë's *Jane Eyre*, and the protagonist from Charlotte Perkins Gillman's "The Yellow Wallpaper" against the backdrop of prevailing gender and societal attitudes in the mid and late 19th century. The paper argues that in spite of gender roles advocating male dominance and female submissiveness that imprison them, both "madwomen" find enlightenment and qualified autonomy in their attic of seclusion, consistent with the ethos of the time in which each author wrote.

Model System for Design of a Medical Diagnostic Device: Hemoglobin A1c

Jose Cabrera, Ifaz Parvez, Natalie Buzaglo, and Oliver Moreira

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Terry McCaffrey**

Abstract

The country is experiencing a dramatic increase in the incidence of Diabetes Type II. In an effort to develop a medical device to both screen and monitor for Diabetes, we commenced a research project that embraced a team approach.

The overall objective was the design and development of a simple device that measures glycosylated hemoglobin, referred to as hemoglobin A1c, by electrochemical means. Patient blood can be accessed by finger prick, and after applying a drop of the blood to a device, lysis occurs by hemolyzing agents. Enzymatic activity will then perform the following steps: (a) digestion of the hemoglobin by a proteolytic enzyme, such that the glycosylated amino acid is liberated from the intact hemoglobin. (b) a second enzyme generates peroxide by oxidation of the glycosylated amino acid, (c) electrochemical detection of the H_2O_2 .

Natalie Buzaglo investigated the lysis of whole blood cells using various hemolytic agents, which is needed to expose the glycosylated hemoglobin.

Ifaz Parvez prepared glycosylated hemoglobin by the non-enzymatic reaction of glucose with both crystalline human hemoglobin and horse hemoglobin. The glycosylated hemoglobin was purified by ion exchange chromatography. The presence of glycosylated hemoglobin was confirmed by MALDI TOF mass-spectroscopy.

Jose Cabrera investigated the enzyme kinetics for the proteinase step using Ifaz's glycosylated product and evaluated the compatibility of the hemolytic agents by Natalie. Mass-spectroscopy, specifically, LC-MS confirmed proteinase activity by observation of the final substrate, fructosyl valine.

Oliver Moreira synthesized fructosyl valine, which can be used as a control for the enzymatic reactions.

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

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. James 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. In recent studies, 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. While fish brain is reported to contain more neurogenic regions than mammalian brain, little else is known about neurogenesis in the adult fish brain. An understanding of the proximity of neural stem cells to blood vessels and their ability to respond to factors circulating in response to environmental changes would advance our understanding of how neurogenesis is regulated. We propose neural stem cells are born in vascular niches and migrate along blood vessels as they exit proliferative zones. 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. We are currently quantifying the cell cycle kinetics, number of cells integrating and undergoing cell death and migration patterns of these cells. The findings obtained in this study will advance our understanding of how neurogenesis contributes to ongoing brain functions and also contribute to future studies examining factors that may alter neurogenesis.

New Findings and Characterizations of NBAii Complex May Hold Key to Drug Delivery

Nishant Patel and Kevin Shah

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Faculty Sponsor: **Dr. Donald Baird**

Abstract

NBAii crystal complexes have been extensively studied and modified with the hopes of implementing them in the real world for extraordinary uses in the medical, optical, and electrical field. Our recent findings have demonstrated that the NBAii crystal not only has a porous configuration for retaining compounds within the dimerized structure but also to evacuate the compound with a given environmental cue. Through the university's newly acquired thermogravimetric analysis instrumentation, GC Mass-Spec as well as X-Ray crystallography we are further able to define and characterized the NBAii compound as well as sub compounds which can be made from similar NBAii skeletons. TGA findings now add one more definite property to this compound with the hopes of being able to implement this retention/evacuation property in drug therapy.

NH-Tautomerism in Para-Substituted Tetraphenylporphyrin Derivatives

Biana Modilevsky

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Maria Ballester**

Abstract

The NH-tautomerism of *meso*-substituted porphyrins has been reported to decrease with porphyrin distortion by enhancing intramolecular hydrogen bonding of the NH protons. Electron withdrawing groups should deshield the internal hydrogen's shifting the NH chemical shift spectra further up field by affecting the ring current, and the opposite effect is expected for electron donating substituents at the *meso* position of the porphyrin core. The effect of several substituents in the *para* positions of the phenyl group of *meso*-substituted porphyrins would be correlated to the NH-tautomerism in *phenyl*-substituted porphyrins.

No Service

Lauren McGarrett
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Farquhar College of Arts and Sciences

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

Abstract

“No Service” is a short film about a young college student named Katy, who is constantly dependent upon her technological devices. When her smartphone and laptop are suddenly stolen, her life is sent into chaos. How will she make it through the day when even the most basic of everyday activities become difficult for her? The film is directed by Lauren McGarrett.

Nucleotide Excision Repair: A New Component in the Study of Breast Cancer

Monica Azer

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Mark Jaffe**

Abstract

Breast cancer is a prevalent cancer that occurs in many women and men today. There are many exogenous and endogenous causes of DNA damage as well as a multitude of repair mechanisms to fix the damage; however, if it is not fixed, the damage becomes a permanent mutation. A series of these mutations lead to cancer. Deficient Nucleotide Excision Repair (NER) is being studied as one of the main mechanisms of carcinogenesis. Deficient NER was found in stage I breast cancers as compared to normal breast epithelium and may be due to over-expression of microRNA. In order to verify this process, antagomirs will be transfected into the breast cancer cells in order to knock out certain microRNA expression, then the cells will be irradiated using UV radiation, the samples will then be purified, and the DNA damage will then be detected using ELISA.

If the microRNA expression could be fixed, the gene repair would theoretically increase and the incidence of breast cancer would decrease.

Parasites of Invasive Snakeheads (*Channa* sp.) in Fort Lauderdale Canals

Elisa D'Abbraccio

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Christopher Blonar**

Abstract

Snakeheads (*Channa* sp.) are invasive fishes native to Asia and Africa that are now ubiquitous in South Florida waterways. Their invasion of Florida waters is of concern because they are aggressive, territorial, predatory, air breathing fishes; these features have allowed them to disperse widely and adapt to a range of temperatures and environmental conditions. Their spread threatens native fishes and aquatic ecosystems throughout South Florida. Invasive species often benefit from parasite release, having fewer parasites than conspecifics in their native range and / or fewer parasites than ecologically equivalent competitors in their introduced range. To assess the possible contribution of parasite release to their invasiveness, snakeheads were collected from Fort Lauderdale canals and examined for parasites. The structure and composition of their parasite community were compared to those of conspecifics within their native range, and with an ecological competitor, the largemouth bass. Preliminary results indicated that the parasite community in introduced snakeheads had only two parasites: a nematode (*Eustrongylides* sp.) and an as-yet unidentified acanthocephalan. This was in stark contrast to the parasite community in ecologically equivalent native fishes such as bass, which previously published work indicated was far more diverse (>50 species). This suggested that invasive snakeheads may be benefiting to some extent from parasite release relative to native fishes.

Porphyrin Geometry- Associated Energy and Binding Conformation

Jessica Millar

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

Faculty Sponsor: **Dr. Maria Ballester**

Abstract

Meso substituted cationic porphyrins are large, naturally occurring macrocycles that are highly substituted, thereby giving them a wide variety of unique properties including the ability bind to DNA. The degree of distortion of these porphyrins caused by peripheral substitution can determine each molecule's particular type of binding to DNA sequences. Previous studies have shown that highly substituted porphyrins with less planar conformations (such as saddle, ruffle, wave, etc.) often have a harder time binding to regions of DNA due to an increase in steric clashes and a larger destabilization of the strand. This experiment's focus is the relationship between conformation and specificity of substituted porphyrin binding to DNA strands. Through a detailed study of optimized porphyrin structures using molecular mechanics and semi empirical methods we can determine the most stable structure of each porphyrin as well as the stability and ease of each binding to predict if such binding could occur naturally within an organism.

**Renewed Presence of the Free-Living Coral *Psammocora stellata* at
Devil's Crown, Galápagos Islands, Ecuador**

Kayla Caldwell

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

Faculty Sponsor: **Dr. Joshua Feingold**

Abstract

The purpose of this study was to document the renewed presence of the free-living coral *Psammocora stellata* in the nearly submerged volcanic cone of Devil's Crown, Floreana Island, Galápagos Islands, Ecuador, and to determine if there were changes in coral cover between two survey periods. This coral species was previously present at Devil's Crown until being extirpated in 1982-83 by impacts associated with the 1982-1983 El Niño-Southern Oscillation. It was observed there in 2007 and was surveyed in 2009 and again in 2011 using the random walk quadrat method. Colony density and live tissue cover was determined using CPCe software analysis. Between the two surveys the number of colonies increased significantly ($p < 0.001$) from 163 ± 79.4 colonies m^{-2} to 323 ± 93.3 colonies m^{-2} , that could be a result of asexual fragmentation and/or sexual recruitment. Total coral tissue area also increased significantly ($p < 0.001$) from $2,414 \pm 1,091$ $cm^2 m^{-2}$ to $3,625 \pm 1,036$ $cm^2 m^{-2}$ due to coral replication and/or colony growth. Average colony size decreased significantly ($p < 0.001$) from 15.8 ± 4.8 cm^2 to 11.6 ± 3.3 cm^2 from one survey to the next which is one expected outcome from fragmentation and/or new coral recruitment. These data indicate that *Psammocora* shows a renewed presence and signs of recovery from earlier extirpation from the site, adding structural complexity and creating habitat for associated organisms. This is heartening news during a period of world-wide coral decline.

Repeatability of Prebrush and Postbrush Plaque Measured via Image Analysis

Nohora Duque

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

Faculty Sponsor: **Dr. Cristina Garcia-Godoy**

Abstract

Objective: This research used image analysis to evaluate the reproducibility of natural plaque accumulation and removal measured instrumentally.

Method: After institutional review and informed consent, healthy adults were enrolled in a study to assess the between-visit consistency of plaque measurement for overnight and post-brush plaque. At Day 1, subjects with overnight (unbrushed) plaque swished with a fluorescein rinse and expectorated, cheek retractors were inserted, and a single digital image was collected under standardized lighting conditions. After routine hygiene with a regular anticavity dentifrice (Crest® Cavity Protection) and standard manual toothbrush, disclosing and imaging were repeated. Approximately 1-week later, the imaging-brush-imaging sequence was repeated. Each digital image was analyzed blind to visit sequence to determine area (%) plaque coverage, and paired images were compared to assess between-visits correlation.

Result: A total of 51 subjects had prebrush and postbrush plaque measurements at both visits, and all data were included in the analysis. Mean (SD) age was 37.4 (15.4) ranging from 18-71 years, and females comprised a majority (58%) of study subjects. Plaque coverage varied across visits, ranging from 2.2-79.2% before brushing and 2.5-42.0% after brushing. By visit, mean prebrush plaque levels were 18.8 & 19.8 at Visit 1 & 2 ($p=0.42$), versus postbrush area of 6.8 & 7.2 ($p=0.38$). Both the prebrush ($r=0.84$) and postbrush ($r=0.80$) plaque areas were well-correlated.

Conclusion: Use of image analysis demonstrates a high level of between-subject variability in natural plaque accumulation and removal, that is highly reproducible between-visits.

Side-bridge Hold Times are Not Related to Injury Prevalence in Female Rowers

Amber Morrell

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

Faculty Sponsor: **Dr. Monique Mokha**

Abstract

Rowing injuries are primarily overuse related and occur commonly to the knee, lumbar spine and ribs. Core tests of strength, stability and/or endurance are used in clinical practice to predict injury. The side-bridge hold test (SBH) is a valid and reliable test of core endurance with female norms of 75 ± 3.32 and 78 ± 3.32 seconds for right and left sides. The purpose of this study was to determine if SBH performance can predict core injuries (ribs, lumbar spine, hip, knee) in intercollegiate female rowers (ROW). A sample of convenience was utilized; 33 ROW free of recent musculoskeletal injury performed the SBH on the right and left sides according to protocol. One ROW did not perform the right SBH. Injury data were collected electronically through injury management software. Mean SBH times were 86.56 ± 12.66 and 86.15 ± 13.68 for right and left sides. Nineteen ROW (57.6%) sustained core injuries. 75% were overuse and occurred to the low back (50.0%) and knee (25%). Other injuries were to the thoracic region (10.7%), hip (10.7%), and thigh (1.0%). Although ROW had greater core endurance than published norms, they sustained overuse injuries specifically to the low back and knee. This is most likely due to sport-specific demands of rowing. Overall, SBH cannot be used to predict injury occurrence in ROW.

Synthesis of the Next Compound in a Homologous Series of Metal-Organic Frameworks

Rachel Salvesson

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

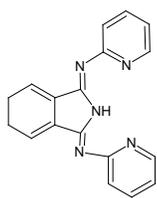
Faculty Sponsor: **Dr. Donald Baird**

Abstract

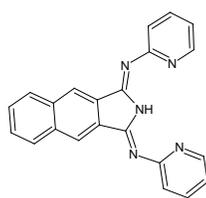
Porous compounds, clays and activated charcoal, have been used as adsorbents in a number of different settings such contrast for x-rays in the medical field. Unfortunately, these adsorbents are not very selective and adsorb just about everything. A new class of adsorbents known as MOF's have become of great interest because these materials are easily altered synthetically and thus offer the promise of improved control over selectivity.

Our interest has been in the derivatives of NBAII, shown below. Notice that structure A has one six membered ring in the backbone while structure B has two. When crystals of these molecules are formed porous structures result as shown in Fig. 2. The pores in crystals made from compound A have maller pores than from crystals made from B. The first two materials have been synthesized and as can be seen the size of the holes in the structure increase as the number of rings in the backbone of the parent molecule.

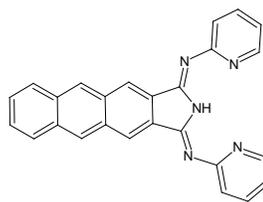
Table 1



A



B



C

It was our intention to produce compound C which has three rings in its backbone for comparison with *the other two*. ***It was anticipated that even larger pores would be produced.***

This poster will describe the synthetic procedures available for compound C and the progress made toward accomplishing that goal. In doing this it will prove that these molecules can be manipulated in the lab. From there research can begin for the selectivity of each of the molecule and put to practical uses.

The Effect of Secondary English Proficiency on the Reading Strategies of International Students

Natasha Vega-Valbuena

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Eric Mason**

Abstract

Scholars have long established that all readers employ strategies to understand complex texts. The most effective readers read not just for content, but ask questions about why authors make the choices they do. These “rhetorical” readers ask not just “what?”, but why?”. Rhetorical reading strategies, as defined by Flower and Haas, are “active attempts at constructing a rhetorical context for a text as a way of making sense of it.” In other words, readers must not only interpret the words on the page based on their grasp of the English grammar and syntax, they must be able to imagine the situation in which such language is used—to guess at the intentions and social situation of the author, and those of the audience.

This research project investigated the degree to which international students whose first language is not English use rhetorical reading strategies in interpreting complex college-level texts. International students in U.S. colleges are commonly required to read texts in English. Even though these students may be proficient in English, they may need to put forth extra effort to understand texts that demand, not just a grasp of the English language, but a situational understanding of the cultures of native English speakers. As an international student, I am aware of the difficulty of making sense of a text that is not in one’s native language. Is it possible that international students may find barriers in understanding texts rhetorically, even when these students are fluent in English as a second language?

The Effects of Enriched Environments on Learning and Neurogenesis in *Octopus vulgaris*

Jelileh Whitmore, Kory Evans, and Divya Pandya

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

Faculty Sponsors: **Dr. James Munoz, Dr. Jaime Tartar, and Dr. Mahmood S. Shivji**

Abstract

Cephalopods, particularly the octopus, have the largest and most complex invertebrate brains and are show markers of behavioral complexity. However, learning and possible concomitant neurogenesis have never been fully described in the octopus. In order to address this need, we will expose *octopus vulgaris* to an enriched environment and test for behavioral learning and neurogenesis. Specifically, octopuses will be placed in either an enriched or standard environment control condition and exposed to various problem-solving tasks and time trials over the course of 30 days. At the conclusion of the tasks, *octopus vulgaris* will be presented with a series of novel tasks for 6 days to see if acquired learning has taken place. Neurogenesis, the birth of new neurons, will be examined as a neural correlate to learned behavior. Thymidine analog incorporation assays, immunostaining, and cell death assays will be used to examine proliferation, migration, and differentiation of neural stem cells. Our hypothesis is that compared to the control condition, the octopuses from the enriched environment condition 1. will show greater learning on the problem solving tasks and 2. concomitant changes in neurogenesis specifically in the vertical lobe, which is thought to be analogous to the hippocampus of mammalian brains.

The Effects of Pre Versus Post Exercise Consumption of an Amino-Acid Based Nutritional Supplement: Effects on Body Composition and Performance

Anamaria Cretu and Sapphire Aragon
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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Jose Antonio**

Abstract

Purpose: The role of nutrient timing in combination with heavy resistance is unclear. There is research to suggest that the consumption of protein pre- or post-exercise may enhance muscular size and strength. The purpose of this investigation was to ascertain the effects Pre versus Post exercise consumption of an amino-acid based supplement (NO Synthesize®) as it relates to the adaptive response to exercise.

Methods: Twenty healthy (n=20) well trained adult males and females (21.6 yrs +- 4.3, 67.9kg +- 9.8, 170.0cm +- 11) were recruited to participate in this 28 day intervention. Subjects were given informed consent and were subsequently tested in the Exercise and Sport Science Laboratory at Nova Southeastern University. Measures included body composition (i.e. body mass, fat mass, and fat free mass via the Bod Pod®) and exercise performance (i.e. muscular strength and muscular endurance) on the bench press. Food diaries were further analyzed.

Results: Findings determined no significant differences in exercise performance (i.e. muscular strength and muscular endurance) in the Pre versus Post exercise consumption groups.

Conclusion: Combining nutrient timing with heavy resistance training still remains unclear. Further investigation into protein pre-or post-exercise as it relates to the adaptive response to exercise must be analyzed.

The Importance of Neurolysin in the Renin-Angiotensin System of the Mouse Brain

Eduardo Carrera, Catalina Breton, and Andrea Linares

Division of Math, Science, and Technology

Farquhar College of Art and Sciences

Faculty Sponsors: **Dr. Robert Speth and Dr. Mark Jaffe**

Abstract

The renin angiotensin system (RAS) plays a major role in cardiovascular disease. Novel metabolic pathways of the RAS offer new therapeutic targets for disease prevention. Recent studies demonstrated a novel binding site for the active hormone of the RAS: angiotensin II (Ang II). This binding site, now known to be the enzyme neurolysin, can metabolize Ang II into inactive fragments and act upon a precursor of Ang II (Ang I) to circumvent Ang II production. Radioligand binding and histological techniques were utilized to assay neurolysin and the primary receptors for Ang II (AT₁, and AT₂) in normal (wild-type) and neurolysin knockout mouse brains. Autoradiograms show that neurolysin is widely distributed in the mouse brain with high expression in areas associated with drug addiction, Parkinson's, and Alzheimer's disease (nucleus accumbens, substantia nigra, and hippocampus). Radioligand binding in the neurolysin knockout brains was reduced by 46%. Residual binding of the radioligand suggests there may be another novel Ang II binding site in the mouse brain. Primary receptors for Ang II in the neurolysin knockout brains were also reduced. There was a 56% increase in lateral ventricle size of the knockout mouse brains suggestive of hydrocephalus, a condition characterized by excessive fluid accumulation in the brain leading to mental retardation. Since the RAS is a major regulator of fluid and electrolyte balance in the body, loss of neurolysin may adversely affect cerebrospinal fluid regulation. Future studies will be directed towards determining the importance of neurolysin for blood pressure regulation and neuropsychological function.

The Influence of Alcohol and Caffeine on Cockroach Motor Function

Isaac Chayo

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

Faculty Sponsor: **Dr. Jaime Tartar**

Abstract

The cockroach has proven to be an excellent model for investigating the pharmacological effects of different substances on nervous system functionality. The increased vigilance and wakefulness associated with caffeine is primarily mediated by its interactions with monoamine neurotransmitters in addition to its role as an antagonist for adenosine receptors. In the case of alcohol, it is an agonist for the inhibitory neurotransmitter GABA, which partly explains its sedative properties and disruptive effects on motor function. In this experiment, we will examine the influence of caffeine and alcohol on motor function in *Blaberus Discoidalis* by designing an enclosed running strip marked with distance units. Fifteen cockroaches (2 females, 13 males) will be administered intra-joint injections consisting of 40% ethanol (7ul), caffeine (10ul of a 1% solution), or a .7% saline solution (8ul) prior to being placed in the enclosure. Performance will be compared between conditions in order to assess potential differences in motor function as a consequence of drug administration.

The Needs of the Many

Nathaniel Dolan

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Charles Zelden**

Abstract

The Great American Experiment began almost 250 years ago, not *necessarily* in pursuit of a new nation per se, but more on the grounds of courageous expedition into the unknown – a grand test-case for what a nation *could* be – and continues to be so courageous and experimental well into contemporary society; the experiment being whether unfettered personal autonomy can indeed exist congruently with social, cultural, and national security. Frankly, all available data suggests that such lofty ideals are ultimately not possible, and that Americans are left, nearly a quarter of a millennia after the fact, with the sobering task of spearheading a whole new world order in which the ideal of personal liberty is charged with the formidable task of achieving an equalizer – a reasonable balance – in a world where threats exist not only at the personal level but in the international theatre. At what point do we come to acknowledge that unrestrained liberty is not a sustainable method by which to manage a society of millions that simply yearns to live free from the threat of harm? At what cost does such security arise; and, what, if anything, are we truly willing to relinquish in terms of personal liberty in order to feel safe in our beds at night? These are the daunting questions facing politicians, philosophers, lawmakers, and contemporary Americans on every social level along with our counterparts across the globe. Where we go from here, and where we ultimately arrive, may well constitute the *next* Grand Experiment.

The Neurophysiology of Attractiveness

Megan Thomas

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

Faculty Sponsors: **Dr. Jaime Tartar, Dr. Valerie Starratt, and Dr. Glenn Scheyd**

Abstract

Evolutionary theories of human mating suggest that both men and women are interested in the most attractive members of the opposite sex. However, men may be more likely than women to be motivated to act on these interests. The goal of this study is to investigate the neurophysiological correlates of these evolved psychological mechanisms relevant to human mate attraction. Electroencephalographic (EEG) event related brain potentials (ERPs) are used as the primary index of the influence of target facial attractiveness on neurobiological processing. Salivary testosterone levels are also assessed to determine the influence of mating-relevant hormones on these processes. Measures of personality and sociosexual orientation are included to identify the effects of psychosocial individual differences on neurobiological responsiveness to perceived attractiveness.

The Potential Effects of Various Concentrations of Saccharin Compared to Sucralose, Stevia, Aspartame, Sugar, and a Typical Diet on Gene Expression in *Yeast*

Beric Berlioz

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

Faculty Sponsor: **Dr. Emily Schmitt**

Abstract

Gene expression patterns present as a result of a typical yeast diet (YEPD), as well as table sugar (sucrose) and four sugar substitutes Splenda (sucralose-based), Truvia (stevia-based), Equal (aspartame-based), and Sweet N' Low (saccharin-based) at varying concentrations (low, medium and high) were determined. The sugar and sugar substitutes were administered and examined at extremely high (340 tsp/100 pounds), typically high (34 tsp/100 pounds), and low (10 tsp/100 pounds) concentrations, according to recently published literature based on the diet of typical American teenagers. Experimental data in the 1970s demonstrated that saccharin had a link to bladder cancer in laboratory rats, making it particularly interesting to investigate the possible effect of saccharin on gene expression in the model organism, yeast. Possible connections between saccharin exposure at various concentrations and gene expression of 16 genes belonging to a total of six different functional group categories (cell cycle control, digestion, transcription, ion channel, kinase, and molecular chaperone) were examined and compared to gene expression patterns found for these genes in yeast exposed to low, medium, and high concentrations of the other sugar-related food additives. For each treatment yeast RNA was extracted, quantified and qualitated using UV spectrophotometry, then cDNA was prepared from the extracted mRNA. PCR was then used to target the 16 particular genes of interest in the cDNA. PCR products were visualized using gel electrophoresis and the resulting gene expression profile for each gene in each experimental treatment (including the typical YEPD, control diet) was determined.

Trip to Hell

Isabel Murillo

Division of Humanities
Farquhar College of Arts and Sciences

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

Abstract

“Trip to Hell” is a short film about a woman who loses her sibling. After this tragic event, the woman’s life changes. She experiences distortions in reality and becomes suicidal. One of her friends helps her to get out of the horrible situation she is experiencing, and leads her to get her life back on track. The film is directed by Isabel Murillo.

Up in the Clouds: An Analysis of Detachment

Katherine McInerney
Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Lynn Wolf**

Abstract

This presentation analyzes the texts of Jonathan Swift's *Gulliver's Travels*, Evelyn Waugh's *A Handful of Dust*, and Gary Shteyngart's *Absurdistan* to examine a common, satirized human flaw. Despite the varied social realms in which the works exist, prevalent in all three is the theme of human detachment, exemplified by characters whose thoughts and actions reveal an emotional disconnect from their respective realities. The reactions of various characters to crucial plot events exhibit this disconnect, with displays of indifference toward poverty, war, and in the extreme, death. This essay illustrates how, through satirical content, the authors highlight behavioral factors that contribute to societal disconnect, such as apathy, ignorance, and morality bred from self-interest. The characters in each novel who perpetrate this phenomenon of disinterest all inhabit the upper echelons of their respective societies; their elevated socioeconomic status is analogous to their perception of themselves in society. Yet, the satirical interpretations of this "above-it-all" attitude illuminate the detrimental consequences of such disregard.

What Goes on Beneath the Green Skin and Purple Pants: Physiology of the Bruce Banner Haplotype Under Stress

Jose Luis Martinez, Giovanni Landauro, and Mustari Akhi

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

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

Abstract

Aggression can occur as a goal-oriented phenomenon where the aggressor is intent on harm, during which, the aggressor experiences low levels of physiological arousal (Tulogdi, et al., 2012). Reduced physiological arousal may be associated with violent behavior, independent of other psychological risk factors. Using this view, sensation-seeking behavior, along with reduced physiological arousal, are key markers of aggression. (Wilson & Scarpa, 2011). Based on prior studies and research in this area, we are testing the idea that acute stress results in blunted biochemical and self-report measures of stress in individuals with low physiological arousal compared to individuals with typical (or high) physiological arousal. Specifically, we are examining the extent to which low physiological arousal is associated with 1. physiological and behavioral responses to acute stress 2. self-report markers of specific behavioral patterns (low anxiety levels, high sensation seeking behavior, and high aggressive behaviors) and 3. a genetic marker of aggression (MAO-A low). We hypothesize that individuals with low physiological arousal will show a blunted physiological response to stress, self-reported aggression, and low MAO-A activity. Participants are tested in one 1 hr session in which they first fill out demographic and self-report questionnaires. Heart rate (HR) and saliva samples are taken 1min before, during (only HR), 1 min after, and 20 min after an acute stress task. Findings from this study will show, for the first time, if low physiological arousal is related to blunted stress responses and increased behavioral and self-report markers of aggression.

Zombies: Round Two

Victor Mascitelli

Division of Humanities
Farquhar College of Arts and Sciences

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

Abstract

“Zombies: Round Two” is a short film. In keeping with NSU’s annual theme of “Life and Death,” and inspired by the popular video game “Call of Duty: Nazi Zombies,” our heroes must battle against zombies in a post-apocalyptic world using some conventional weapons and some weapons that are out of this world. Will our heroes survive? Probably not. The film is directed by Victor Mascitelli. Crew members and actors include: Kelsey Cortez, Eddie Arocho, Chris Foy, Frank Taylor, Saily Rigüero, Jacob Hiler, Andrew Watson, Samantha Kountz, and Zak Rakszawski.

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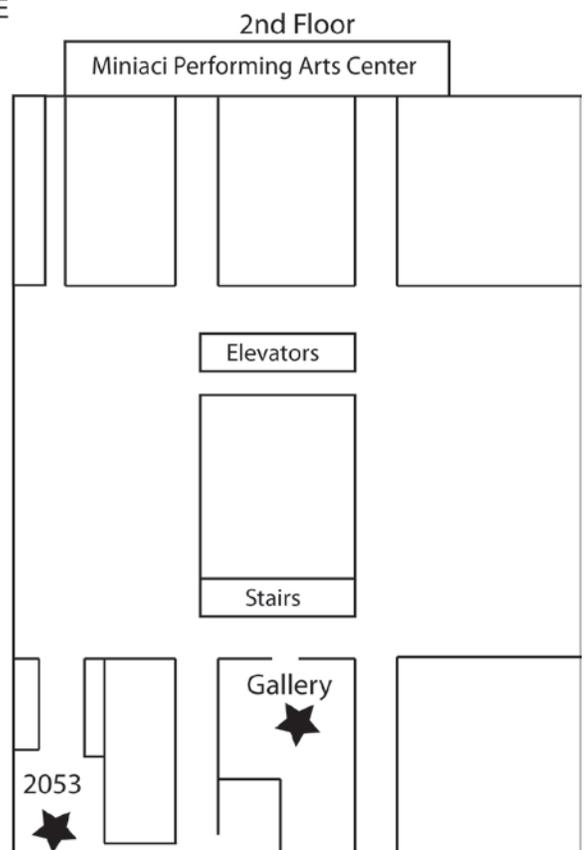
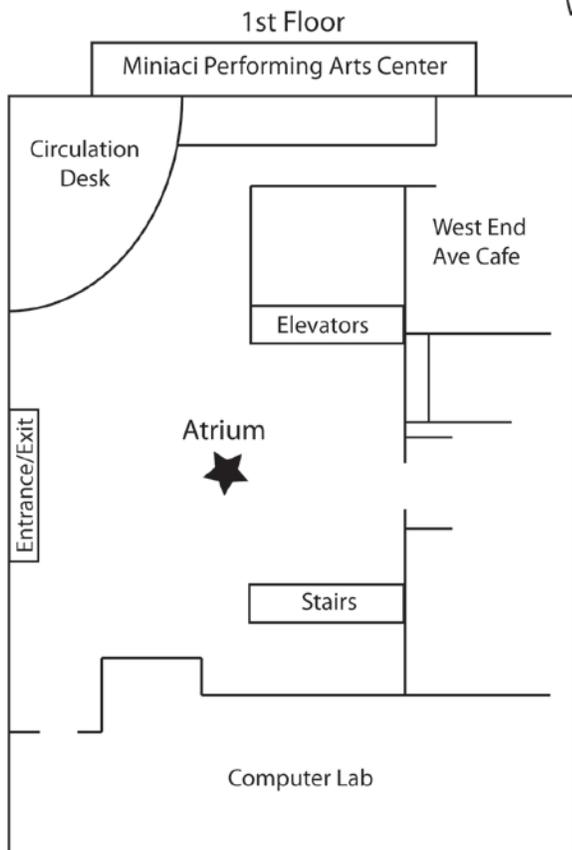
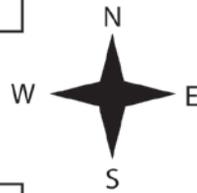
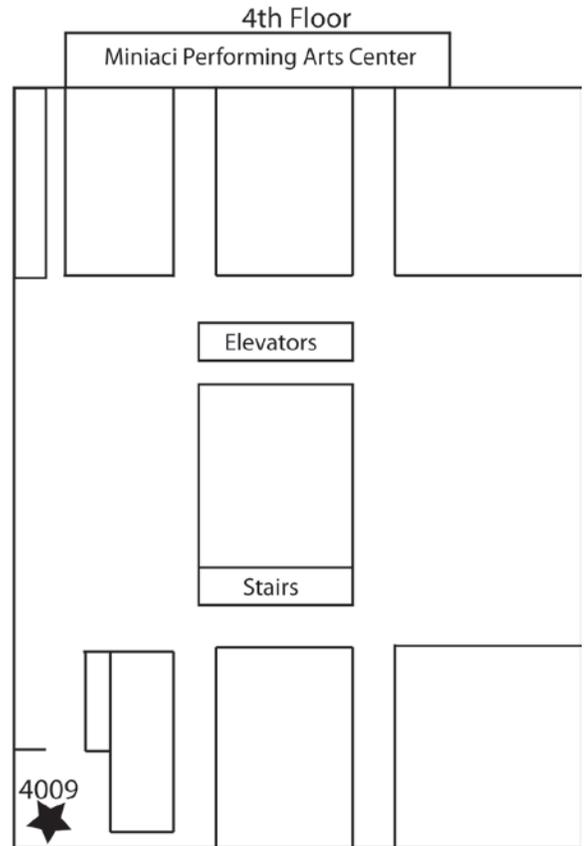
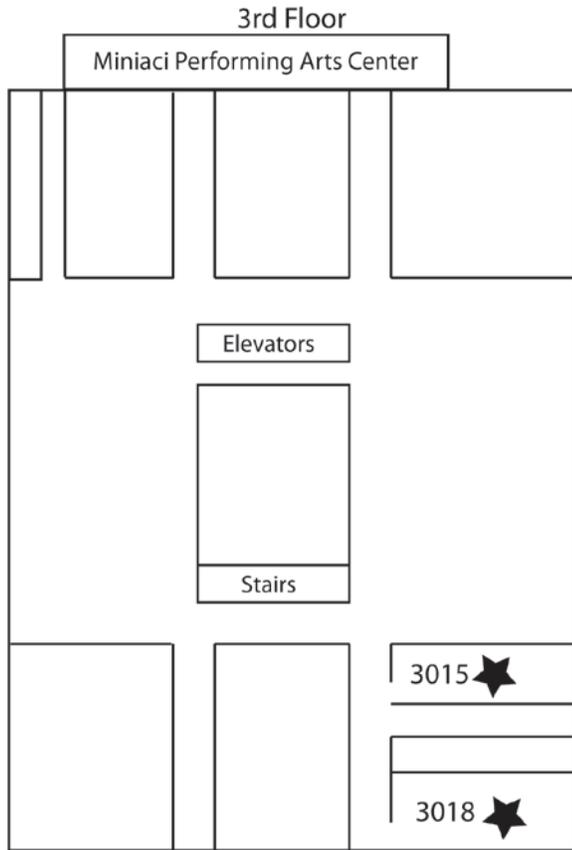
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Jaime Tartar
Julie G. Torruellas
Lindsey Vigessaa

Alvin Sherman Library, Research, and Information Technology Center



UNDERGRADUATE STUDENT SYMPOSIUM

2013 Program Schedule

TIME	EVENT AND LOCATION		
1:00 p.m. to 1:45 p.m.	Welcome and Introduction – Don Rosenblum, Ph.D. Keynote Speaker – Andrea Shaw, Ph.D., “Getting Lost to Find Your Way ” Performance Theatre Don Taft University Center		
1:45 p.m. to 3:00 p.m.*	Poster Presentations	First Floor Atrium	Alvin Sherman Library
1:45 p.m. to 4:00 p.m.*	Film Presentations	Second Floor Gallery	Alvin Sherman Library
3:00 p.m. to 4:00 p.m.*	Oral Presentations	Room 2053	Alvin Sherman Library
	Oral Presentations	Room 3015	Alvin Sherman Library
	Oral Presentations	Room 3018	Alvin Sherman Library
	Oral Presentations	Room 4009	Alvin Sherman Library
4:30 p.m. to 5:30 p.m.	Awards Ceremony	Performance Theatre	Don Taft University Center

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