

Keynote: Dr. Charles Messing, Division of Math, Science and Technology -
“Wait a Minute...That's Funny.”

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A Cure for Poverty

Naika Gabriel, Jessica Husted

H. Wayne Huizenga School of Business and Entrepreneurship
School of Business

Faculty Advisor: **Charles Harrington**

Abstract

We affirm that poverty is a multidimensional disease and its eradication centers on sustainable economic development. The report focuses on the determinant of growth in general and its impact on GAI and Grameen Bank. It has been found that investment in human capital, physical capital, technological change, education and training are the key determinants of future, sustainable growth.

A Dream

Amy Harvey

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. James Doan**

Abstract

Written by Amy Harvey in 1999, the poem was inspired by the concept of the author's image of an angel. The author's hope is that it evokes interest in the ongoing question: "Do Angels exist?"

AIDS: An African Epidemic

Christina Bethea

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Allison Brimmer**

Abstract

Every year in Africa, millions of adults and children are infected with AIDS. This disease is the number one killer in Africa, even outweighing malaria. AIDS has infected over 39 million Africans in total. Additionally, despite the fact that it holds only 10 percent of the population, 90 percent of the world's AIDS orphans are on this continent. Obviously, this disease threatens the African life expectancy, dropping it from 66 to 33 years of age. It cuts off workers in their prime, thus affecting many of Africa's businesses and making Sub-Saharan Africa's GDP suffer. Unfortunately, if the African market suffers then so does the American market. In addition to spreading awareness about the issue, this paper addresses ways to prevent the epidemic from worsening. One simple way to discourage spreading the disease is by distributing condoms. Regrettably, not nearly enough condoms are available in Africa, especially Sub-Saharan Africa, to make a meaningful impact in reducing the number of AIDS cases. The "cocktail" for HIV treatment is more expensive than condom distribution and the African government needs all the help it can get in funding the distribution of this drug concoction. Access is a key issue in treating those who are infected with HIV. To help raise money in the fight against HIV, the African government turns to other governments to pick up the slack. The US, with all its money and power—and its citizens—must work to help make a difference in the lives of people throughout the world.

Analysis of Elie Wiesel's "Perils of Indifference"

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Farquhar College of Arts and Sciences

Faculty Advisor: **Jennifer K. Reem**

Abstract

Elie Wiesel grew up in the Carpathian Mountains during the rise of Nazi Germany. As a boy he survived four concentration camps, and when he was freed, moved to France. He then began to write about his experience in the Holocaust, and from his works, became an icon of peace. In 1999, Wiesel spoke at the Millennium Lecture Series where he discussed the indifference that has plagued the world both in the past and in the current moment. This speech was analyzed using Aristotle's Modes of Persuasion which is based on how the speaker uses ethos, pathos, and logos. It was determined that Wiesel's speech contained all three of these elements to varying degrees, which made his speech very effective in showing the audience what indifference is, and how it is prevalent in our world.

Analysis of Interactions between *Candida Albicans* and *Staphylococcus Aureus* in Mixed Species Biofilms

Yi Jey Lin, Fabio Vogel

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

Faculty Advisor: **Dr. Joshua S. Loomis**

Abstract

Biofilms are multicellular communities of microorganisms that characteristically attach to some surface, produce and encase themselves within a thick polysaccharide matrix, and resist physical insults and treatment with anti-microbial drugs. To date, most biofilm studies have focused on pure biofilms consisting of a single species rather than more natural biofilms that contain multiple species of bacteria and fungi. The studies described here focus on characterizing the physical interactions between a bacterium (*Staphylococcus aureus*) and fungus (*Candida albicans*) in the context of a mixed biofilm. Both of these organisms are common human pathogens that cause a variety of human disease. Initial studies focused on whether each organism affects the attachment and growth of the other in the context of a biofilm. *C. albicans* attachment was shown to be enhanced by the presence of *S. aureus* when both are added at the same time to a plastic dish. Conversely, *C. albicans* attached less efficiently to the plastic surface if *S. aureus* was allowed to form a biofilm prior to adding the *C. albicans*. Furthermore, examination of organism growth within the biofilm revealed that the presence of *S. aureus* adversely affects the growth rate of *C. albicans*. These data suggest that the two organisms are interacting with one another within the biofilm. Scanning electron microscopy of the mixed biofilm appeared to confirm this hypothesis by showing the two organisms physically touching one another. Further studies will address whether the organisms affect one another's ability to resist physical and chemical insults.

Anatomy Cat Dissection Software: Developing a Study Resource CD-ROM for NSU Undergraduate Anatomy and Physiology Students

Christopher Tann and Crystal Rego
Division of Math, Science and Technology
Farquhar College of Arts and Sciences

Faculty Advisor: **Dr. Paul Arena**

Abstract

The purpose of this research project is to develop an interactive CD-ROM study tool, specifically designed for cat dissections. A group of 9 Premedical Society students will be performing dissections on eight triple injected cats. The students will be taking still pictures along with interactive video to demonstrate various dissection procedures in addition to viewing anatomical structures. Dr. Paul Arena will be the advising professor along with Dr. Robin Sherman who will be assisting in the dissection process and providing her expertise in mammalian dissections. The pictures will be placed on an interactive CD-ROM, which will be a useful study tool for future Anatomy and Physiology students. There will also be helpful lecture review material and interactive games and activities. Some of the interactive quizzes available will consist of drag and drop, jeopardy and matching games. We will be working with Susan Lutz in the IT department of Nova Southeastern University on the development of the CD-ROM. Ms. Lutz will be creating and formatting our main page interface and compiling our pictures into the program. The CD-ROM will consist of several modules that can be accessed from the main page which is designed as a creative laboratory setting. The various sections that can be accessed will include: muscles, skeletal structures, as well as the histology portion of the Anatomy and Physiology lab. This should be an extremely valuable research tool for NSU undergraduates, which we hope will increase academic performance in their Anatomy and Physiology courses.

Anthropogenic Effects on Biodiversity

Abir Rahman

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Farquhar College of Arts and Sciences

Faculty Advisor: **Dr. Paul Arena**

Abstract

Humans are consumers and rely on the environment surrounding them for survival. Early in human history our populations were small and resources were relatively unlimited. However, our numbers have been increasing exponentially and with this population explosion has come greater demands for resources. Frequently, our development and resource allocation causes detrimental environmental impacts. For instance, destruction and fragmentation of habitats and increased pollution have led to a reduction in animal abundance and species richness. Severe impacts on some habitats have left many species without adequate resources available to survive, which ultimately results in extinction. "It is the nature of human beings to control their environment as much as possible. It allows our species to spread to new habitats and obtain new sources of food." (Otten 2001). Unfortunately, our self-centered society tends to ignore the needs of the world's diverse biota and rarely understands the importance of their existence. The current extinction rate has been estimated to be higher than the mass "Cretaceous Extinction", which killed off the dinosaurs and was caused by an asteroid impact. This review will discuss: the importance of maintaining biodiversity, specific anthropogenic effects on biodiversity, as well as cite examples where conservation efforts have successfully "turned the tide".

Attraction on the Basis of Relationship Status

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Faculty Advisor: **Weylin Sternglanz, Ph.D.**

Abstract

Research has shown that the criteria women use to evaluate men's attractiveness shift across the menstrual cycle (Gangestad & Thornhill, 1998). For example, when women are in the fertile phase of their cycle, they report greater attraction to men who display high intrasexual competitiveness (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004). We propose to examine female college students' attraction to men based on the phase of their cycle and the men's relationship status. In a between-participants design, female college students will either be told that a male confederate is single or in a relationship. We will then ask the female college students to rate their attraction for the confederate. We predict that female participants' attraction to the confederate will vary systematically based on (a) the phase of their reproductive cycle, and (b) the relationship status of the confederates. Implications for evolutionary psychology will be discussed.

Biological Factors and Beyond: The Negative Impacts of Radiation and Radioactivity

Supraja Kolluri, Marisa Abrahim, Pamela Kolonias, Justin Chambers

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

Faculty Advisor: **Dr. Dimitrios Giarikos**

Abstract

Exposure to radiation from both natural and man-made sources leads to biological damage at any dosage. Lower doses can result in vomiting and blood count changes, while higher doses can lead to cancerous growths and death. With the implementation of technological advances that utilize radioactive substances, humans and the environment are being exposed to levels of harmful radiation. Thus, the objective of this presentation is to elucidate the biological, social, and environmental effects of radiation by examining past nuclear disasters and experimental research.

Comparing Nuclear Fission and Nuclear Fusion as an Alternative Source of Energy

Natasha Antonovich, Michael Ratliff, Neeketa Sheth

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

Faculty Advisor: **Dr. Dimitrios Giarikos**

Abstract

The purpose of this research project was to explore alternate nuclear energy sources. The nuclear energy sources that were examined were fission and fusion. From the research that was done, pros and cons were found for each type of nuclear energy. Fission, being an established technology for energy, posed an economical advantage; however, the waste that is given off from these reactions is a great environmental detriment. Fusion reactors are newer nuclear energy sources, thus they are more costly, but their lack of radioactive waste gives fusion an environmental advantage. Given that both reactions have positive and negative sides to them, it was determined that the best option would be a fission-fusion hybrid where the fusion reaction's neutrons fuels the fission reaction.

Control and Uncontrollable Bonding

Ryan Frabizio

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Farquhar College of Arts and Sciences

Faculty Adviser: **Dr. Suzanne Ferriss**

Abstract

For my project I studied Mona Simpson's novel *Anywhere But Here*, as well as the film based on Simpson's novel. It is a story of a woman, Adele, and her daughter, Ann. Though the novel deals with potentially universal issues pertaining to motherhood and childhood, Simpson focuses these down into a woman-to-younger-woman relationship. Adele is a single mother, and some of the novel relates the issues of single working mothers' balancing of motherhood with professional, familial, and romantic relationships. Ann grows up during the novel often contemplating her frustrations with her mother, and how she will react when she is of legal age and can separate herself from her. Much of *Anywhere But Here* is about control, demonstrated through Adele's determination to maintain authority over her daughter while balancing her personal and professional goals, while Ann resists her mother, inspired by keeping her thoughts on her own evolving independence as she approaches and turns eighteen.

Cost Benefit Analysis of Anti-Microbial Consumer Products

Besty Jacob & Crystal Rego

Division of Math, Science and Technology

Farquhar College of Arts and Sciences

H. Wayne Huizenga School of Business and Entrepreneurship

School of Business

Faculty Sponsor: **Dr. Robert Pomeroy & Charles Harrington**

Abstract

The use of Anti-microbial products in products such as hand sanitizers has been steadily rising in recent years. These products are cheap, convenient, and promise to kill 99.99% of bacteria without the use of water. However according to an FDA panel studying the claims from the manufacturers that produce these hand sanitizing products there is no conclusive evidence that there is any benefit from use of these products. The chemical Triclocarban and Triclosan are the active ingredients in these products. And although the manufacturers of these products claim their products are biodegradable, tests conducted around the country have shown detectable quantities of these chemicals making their way through the waste water treatment process. Triclocarban and Triclosan are suspected carcinogens they are also pre-dioxins and can be converted to dioxins when exposed to sunlight. These products have been found in breast milk as well as the food supply as well. The chemicals are being found in water samples and sludge left over from the waste water treatment process as well. Millions of pounds of these biocides are being dispersed into the environment every year and since it is not being degraded properly this could leave a chance for bacterial mutation and resistance. Triclosan exposed bacteria have shown resistance to 7 antibiotics and one harmless bacterium has already shown resistance to these chemicals. Do the benefits of the products outweigh the future and present costs of continued use or do they simply provide a false sense of security while threatening our environment and possibly our health.

Cranberries: The Use of a Naturally Occurring Compound to Fight against Periodontopathogens

Debbie L. Darius

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

Faculty Advisor: **Dr. Emily Schmitt**

Abstract

This literature review focuses on the use of a naturally occurring compound found in cranberries (proanthocyanidins) to fight against periodontopathogens and thus the development of periodontal disease. Periodontopathogens and their invasion in gingival tissues and periodontium is the usual cause of periodontitis. Oral microorganisms coaggregate to become major bacterial complexes, allowing their proteases to digest similar components of the gingival crevicular fluid located in subgingival sites. The most common microbe associated with this disease is *P. gingivalis* where its proteolytic enzymes gingipains and dipeptidyl peptidases IV break down collagen and create large supplements of iron for the bacteria. However, recent studies have suggested the polyphenolic compound, proanthocyanidins, may inhibit the proteolytic activity of these bacterial complexes and compromise the growth and life span of the periodontopathogens. Further experiments have extracted non-dialysable material from cranberries and applied it to various bacterial cultures to analyze its effects on bacterial cell adherence to host cells and proteolytic activity. Thus, raw cranberries are believed to contain a potential compound that can be used as a preferred alternative treatment for periodontitis.

Detecting Deception from Thin Slice Communications

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Farquhar College of Arts and Sciences

Faculty Advisor: **Weylin Sternglanz, Ph.D.**

Abstract

Research suggests that people are not very skilled at detecting deception from ordinary communications (Vrij, 2000). A recent meta-analysis (Bond & DePaulo, 2006) indicated that the average accuracy in discriminating a truthful from a deceptive statement was 54%, when chance is 50%. Another line of research has shown that people are able to make remarkably accurate inferences from very brief exposures (or “thin slices”) of nonverbal behavior (Ambady & Rosenthal, 1993; Willis & Todorov, 2006). We propose that the ability to detect deception may actually be greater when people observe thin slices communications rather than longer communications. In a within-participants design, 80 college students will attempt to discriminate truthful from deceptive communications based on either long or thin-slice videotaped clips of people discussing their friendships. The findings may have important implications for the fields of deception detection and interpersonal perception.

Dissonant Composition: Gender Inequalities in Music

Greg Kyriakakis

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Adviser: **Dr. Kate Waites**

Abstract

Gender constructions are inescapable in society; it is therefore understandable that inequities have permeated the realm of classical and popular music. From the types of instruments young children decide to study to the composition of modern rock bands, gender roles and expectations have helped shape the state of music. Women who further their study in music predominantly learn from the works of male artists, influencing the female musicians' style while crippling personal creativity. Even the body of the performer plays a role in the type of instrument studied; female vocalists rely on their body to produce sound while male musicians are more inclined to use technology, such as the guitar, to aid in sound production. Males and females occupy different roles as musicians. Rock bands tend to feature male performers and have limited roles for females save for sexual appeal or gimmicks. Female artists gravitate toward solo pop music performance in which they are heavily sexualized. These types of constructions are perpetuated and reinforced by mediums such as the music video.

Drowned

Amy Harvey

Division of Humanities
Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. James Doan**

Abstract

Written by Amy Harvey in 2007, this poem offers more than meet the eye. The poem is actually an allegory. Its allegorical meaning is based on the true experiences of the author. Here the experience is given a different location, which aids indirectly in the poem's explanation. This poem was created for personal reflection and healing. The author's hope is that those suffering from abuse will find their voice and demand to be heard.

Effect of *Ginkgo Biloba* on Short-Term Memory

Tommy Gaertner

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

Faculty Advisor: **Dr. Paul Arena**

Abstract

Ginkgo biloba has been used for thousands of years in traditional Chinese medicine to improve vascular and cognitive functioning. *Ginkgo biloba* is widely prescribed for the prevention and treatment of dementia in Europe. In addition to having a direct effect on cognitive functions of live laboratory mice, the extract of *Ginkgo biloba* also increases production of a neurological chemical responsible for enhancing cognitive performance. However, many scientists have pointed out these results are based upon limited research and have expressed the need for additional studies. This study will investigate short-term effects of *Ginkgo biloba* on healthy individuals. If *Ginkgo biloba* can prevent cognitive degeneration in patients with Alzheimer's disease or dementia, then the botanical medicine may be helpful in boosting short-term memory performance in healthy individuals. This research will utilize a double-blind trial divided into three separate timed memory tests. Participants will be randomly assigned to a *Ginkgo* or placebo group before each trial and will then take a short quiz. The first two memory tests are based on visual-symbolic memory and the third test on verbal memory. Results will be based on individual performance across all three trials. Statistical analysis of results will reveal what effect, if any, *Ginkgo biloba* has on short-term memory. If the results are significant and beneficial effects of *Ginkgo biloba* on cognitive function are detected then taking this natural supplement would increase memory recall of required course material for college students. This would be an important result and should lead to increased student performance

Effects of Newly Developed Anticancer Drugs Against GI101Aluc Mammary Tumor Implanted in Athymic Nude Mice

Ambreen F. Parvez and Frantz Etienne

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

‡Department of Pharmaceutical and Administrative Sciences
College of Pharmacy

Faculty Advisor: **Dr. Appu Rathinavelu**

Abstract

The purpose of this research is screening anti-cancer drugs using tumor bearing animals. To achieve this, we used a mammary tumor cell line GI-101A that was developed from a metastatic breast tumor xenograft. The GI-101A cell line had been previously transfected to express the luciferase gene (GI-101Aluc). Luciferase expression in the tumor cells enables the imaging of tumors in a molecular imager rather than performing surgery. For drug screening analysis, twenty-four athymic nude mice were implanted subcutaneously with GI-101Aluc cells. The animals were rested for 3 weeks after implantation for establishing tumor growth. During this period their weight and tumor volume were monitored weekly. When the primary tumors reached a volume of 100mm^3 , the mice were treated orally and intraperitoneally with anti-cancer agents code named MH51 and JFD. Sodium Phenylacetate [NaPA] and Cisplatin were used as their respective positive controls in our experiments. JFD compound was injected intraperitoneally and compound MH51 was given orally *ad libitum*. Their cytotoxic and cytostatic effects were monitored using real time *in vivo* molecular imaging techniques. Our current results include successful implantation of luciferase expressing cancer cells and generation of palpable primary tumors in nude mice. After 3 weeks of treatment, regression of the tumors was observed with Cisplatin, and JFD drugs while compound MH51 did not show any significant changes. The drug treatment was continued for another 3 weeks. (This research was supported by generous donations from the Royal Dames, Inc.)

Effect of Professional Sports on Local Economies

Jordan Smith and Wael Sankar

H. Wayne Huizenga School of Business and Entrepreneurship
School of Business

Faculty Sponsor: **Charles Harrington**

Abstract

In today's world economy there are several factors affecting local economies. One major social interest is sport. Owners of major league sports teams have agreed that the buildings of new facilities are a necessity if a team is to remain financially viable, and competitive. New arenas and ball parks have sprung up around the country funded in some part by public dollars. Subsidizing stadiums is the idea of a local government taking taxes from local citizens to help to pay for the facilities. The belief that subsidizing stadiums helps in supporting other businesses in the surrounding areas, has made these types of taxes viable for the last several decades. The question begs itself, does public spending on athletic venues provide a significant enough payback to justify the significant investment.

Forearm Injury in a Female Collegiate Rower: Case Study

Priscilla Rashida Dobbs

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

Faculty Sponsors: **Dr. Patricia McGinn**

Abstract

The topic of this project is to examine a forearm injury sustained by a female collegiate rower. The final diagnosis, based on MRI and X-ray testing, was Left Forearm Pain with a Grade I Flexor Carpi Ulnaris Strain, though initial signs and symptoms led the sports medicine team to suspect more serious injuries. The athlete received conservative treatment and rehabilitation exercises were initiated, aimed at restoring full strength and function. The certified athletic trainer and athletic training student observed a “mass” over the anterior forearm during the initial evaluation. The defect was more prominent with wrist and finger flexion; however, the athlete did not present with ecchymosis or swelling in the area. During visual inspection, the presence of bilateral bowing of the forearms proximal to the wrist was noted. Differential diagnosis included spasm of the flexor digitorum profundus and flexor group, strain of the pronator teres, strain of the flexor digitorum superficialis and rupture of the flexor digitorum profundus. A unique predisposing factor to the initial impression of a rupture was the presence of Madelung-like deformity of the left forearm which caused the muscles angle of pull to be altered. This could have caused the athlete to have some weakness of the musculature increasing the likelihood of injury. The deformity of the forearm caused the mild, localized swelling of the Flexor Carpi Ulnaris strain to present as a “herniation-like” mass through the forearm fascia. The goal of this study is to examine this case in full, with emphasis placed on literature regarding Madelung and Madelung-like deformity.

John F. Kennedy's Inaugural Address

Marsha Mitchell

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Farquhar College of Arts and Sciences

Faculty Advisor: **Professor Jennifer K. Reem**

Abstract

John F. Kennedy's inaugural address is one of the greatest historical speeches in American history. It was written in 1960, and is quite often quoted, utilized for declamation and evaluated publicly by many individuals. President John F. Kennedy delivered this famous speech on January 20, 1960 after being victorious in the presidential election. It was then he gave hope to the American people; and it is often considered that hope is like a river, and President Kennedy was the river that flowed at that particular time, bringing with it life and productivity to the American public. This speech is considered both memorable and effective in terms of the content, style and delivery. Evaluation of the speech was performed by utilizing the Burkean Pentad, and this method accurately measured the success of the speech and by extension the main reason why it was so effective in achieving its purpose. Additionally, by evaluating the style, structure and linguistic devices utilized through out his inspiring address, it became naturally visible and ultimately quite evident why this intelligent speech was so memorable; innovative and motivating. The inaugural address of the speech was certainly a masterpiece, and it gave great hope to a people that were in dire need of positive changes that would eventually enable them to lead productive and purposeful lives.

Journeys in Love

Iva Christina Marc
Division of Humanities
Farquhar College of Arts and Science

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

Abstract

The name of my film is Journeys in Love. The theme of the film details the processes we go through in the name of love. The purpose of this film is to embrace the ups and downs within a relationship and show how love continually provides the healing necessary to bring people back together. My principle cast members are Roslie Laurent and Ray D. Pollock. My crewmembers are Jonathan Marc and Roger Casanova.

Know Thyself

Afroza Khan, Elizabeth Gist, Titina Gist, James St. Louis, Britannica Jeffers
Division of Humanities
Farquhar College of Arts and Sciences

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

Abstract

“Know Thyself” is a short film about a group of first-year college students who learn of their identity through their English professor. It was written by Afroza Khan, directed by Elizabeth Gist and Titina Gist, Edited by James St. Louis, Production manager - Britannica Jeffers, and the actors are Afroza Khan, Gumba Ligden, Harleen Kaur, Itza Miranda, Jigna Shah, Lesly-Loudmar Mathurin, Matt Mercil, Mickele Mentz. The film begins by focusing on Dr. Avery, the professor of English 101. The kind, smart, and stern professor starts the class by discussing the book “Brave New World,” by Aldous Huxley. The seven students in Dr. Avery’s class are very interested in discussing the book. Dr. Avery notices how the seven students each have their own unique distinctive personality. Through the heated discussions about the book, each student’s personality is revealed in greater depth. Dr. Avery comes to realize that the seven students represent the seven deadly sins. This funny, twisted, and intriguing story shows how a person can personify a sin without being aware of it.

Leaving a Legacy: Redefining Volunteerism for Older Adults in Broward County

Kathryn Levine

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Faculty Advisor: **Dr. Mark Jaffe**

Abstract

Volunteering has played a very important role in the lives of elderly Americans since during the time of the depression in the 1930s. This study proposed the development of a new model for volunteerism by offering a group of older adults a course in leadership training. The purpose of this course was to create and implement a community service project while exploring different ideas of aging. The goal was to create a meaningful pathway in which an older adult could utilize his/her time and life experiences in a generative and integrative way that links a sense of purpose to higher levels of well-being and contributes to the quality of life in Broward County. Pre and post tests were done utilizing the Loyola Generativity Scale (LGS) to measure the success of the course. This scale is based on Erikson's psychosocial stage of development: generativity vs. despair. The course was composed of 10 elder adults that consistently participated in a 10 week course that met every Wednesday. During the last class, a focus group was held to discuss the group's view of their experience in the class. The results showed that an increase in generativity resulted from review of the pre and post test. Projects started from the interests and concerns of the participants who used the structure of the course to explore ways to connect those concerns to public service within the community.

Mechanisms of Action of Ketoconazole and Voriconazole on *Trichophyton rubrum*: Effects on Growth, Cell Division, and Cell Membrane Morphology

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Faculty Adviser: **Dr. Mark Jaffe**

Abstract

Onychomycosis, the infection of nails by fungal dermatophytes, affects from 3 up to 10% of the world's population. Therefore, it is important to design an effective drug treatment for this condition. Since most onychomycosis infections are caused by the *Trichophyton spp.*, the aim of this experiment is to study two anti-fungal drugs', Voriconazole and Ketoconazole, minimum inhibitory concentrations (MICs) on *Trichophyton rubrum* (*T. rubrum*). More specifically, the MICs of reference to be studied are 4, 2, 1, 0.5, 0.25, and 0.125 $\mu\text{g}\cdot\text{mL}^{-1}$. Additionally, comparing the MIC's of Voriconazole and Ketoconazole will improve our understanding of the separate mechanisms of action of these two azoles. After finding the most effective MICs for both drugs and comparing their effects on *T. rubrum*'s growth, cell division, and cell membrane morphology, a more effective drug treatment could then be proposed. This proposed drug treatment could change the morphology of microconidia, inhibit the production of ergosterol, a lipid which contributes to the fluidity of fungal cellular membranes, and consequently alter *T. rubrum*'s endomembrane system and rate of growth. In addition, this proposed treatment could involve a combined dosage of Voriconazole and Ketoconazole. Ultimately, this project will attempt to design a more effective treatment of onychomycosis by comparing the MIC's of both Voriconazole and Ketoconazole on *T. rubrum*'s cellular growth, cell division, and cellular membrane morphology.

Methicillin Resistant *Staphylococcus aureus* (MRSA) Prevalence, Awareness, and Prevention in the Athletic Setting

Deirdre Foisy

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Faculty Sponsors: **Dr. Elizabeth Swann** and **Dr. Patricia McGinn**

Abstract

To examine the current prevalence, awareness and prevention of Methicillin Resistant *Staphylococcus aureus* (MRSA) utilizing an online survey and sending it nationwide to Certified Athletic Trainers. Methicillin Resistant *Staphylococcus aureus* (MRSA) is an emerging resistant form of bacteria which is becoming more apparent in the athletic population. Few studies have assessed the prevalence among athletes and the efficiency of athletic trainers and sports medicine professionals with the identification of the signs and symptoms associated with MRSA; an easily transmitted form of bacteria. To assess the prevalence of MRSA among the collegiate athletic population and the efficiency of athletic trainers and sports medicine professionals with the identification of the signs and symptoms associated with MRSA; an easily transmitted form of bacteria. With the absence of normative data regarding MRSA prevention strategies and reported cases among athletes, a comprehensive survey may provide valuable information regarding MRSA. The results of this survey may identify geographic areas of concern, while providing information that may assist health care professionals create treatment protocols for wound care and assist with the reduction of bacterial transmission. The goals of this study are to define MRSA, identify at risk populations, report prevalence among various athletic populations, and discuss successful prevention and possible treatment strategies. These goals will be achieved through the use of an online survey administered to Certified Athletic Trainers across the country. The goal is also to consider future studies that need to be preformed including where the bacterium is manifested within athletics.

Molecular Chaperones and Parasites

Andrew Deonarine

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Faculty Advisor: **Dr. Emily Schmitt**

Abstract

Molecular chaperones and chaperonins are proteins found in all living organisms from the prokaryotic bacteria all the way to the eukaryotic human. These proteins serve to play several important roles within the cell. The tasks vary from assisting directly or indirectly in the folding of nascent proteins produced by the ribosome, repairing heat damaged proteins, involvement in cell signaling, and cell differentiation. Many of these proteins are inducible in response to heat. Therefore they became known as heat shock proteins (Hsp). Proteins are absolutely vital in any cell. They serve specific structural and functional roles to enable cellular life. Currently, scientists know basically how chaperones and chaperonins work, but the complete mechanism is still unknown. ATP hydrolysis is seen to be implicated in changing the conformation of chaperonins which therefore alter the conformation of the nascent protein. Chaperones and Chaperonins are currently being implicated in studies to further understand their roles in some common human parasitic organisms. The primary three parasites investigated in this review of the literature are *Plasmodium falciparum* (*P. falciparum*), *Trypanosoma cruzi* (*T. cruzi*), and *Leishmania donovani* (*L. donovani*). Each parasite is known to cause malaria, Chagas disease (African sleeping sickness), and Leishmaniasis respectively. Another parasite, *Entamoeba histolytica* is briefly discussed as well. This literature review will further examine the various Hsps in these parasites and outline their function as well as implications for medical treatment and further research.

Mythmaking, National Identity and Balkan History

Tajhira Omphroy

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Faculty Adviser: **Dr. Gary Gershman**

Abstract

The Balkans, a region seen as “the powder keg of Europe” since the 17th century, is a complex labyrinth of nationalism, ethnicity and religion. Balkan history is best explained in terms of the myths that are the foundation of both religious and nationalistic fervor for the various Balkan ethnic groups. The protagonists of these myths have become not only national heroes, but also saints of the Orthodox Church. In this way, the mythology of each Balkan nation or ethnic group envelops both nationalistic pride and religious beliefs, the result of which is a powder keg that frequently explodes.

Nuclear Fuels Dominant over Fossil Fuels?

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Faculty Advisor: **Dr. Dimitri Giarikos**

Abstract

With decreases in fossil fuel reserves and the resulting increases in price (especially with the war in Iraq), converting to nuclear power just may be the proper solution to this political, economical and social conundrum. Nuclear energy and fossil fuels work similarly in that they are used to heat up water into steam, which in turn pumps turbines to create electricity. However, they differ in the fuel they use to heat the water, which brings forth various disadvantages as well as advantages. Could it be possible that nuclear energy, even with its higher costs and higher risks of releasing radioactive materials will triumph the nonrenewable, global warming contributing fossil fuels? What began as a simple project has become the justification for an energy source that will power humanity into the future.

Online Professional Basketball Statistics Tracker

Allen Furmanski

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Faculty Advisor: **Dr. Paul Kenison**

Abstract

The world of professional basketball is more than just a sport – it's a business. As with any business, the goal is to maximize productivity by continually making changes to improve efficiency. The purpose of this program is to allow the coaches of a professional basketball team to obtain optimal efficiency by providing them with the tools to monitor all aspects of their team. From determining the leaders in various categories such as 3-point field goals and steals to displaying success percentages of various offenses and defenses, the primary goal is to give the team's coaching staff absolute control by presenting relevant information in a clear and concise manner.

The main advantages of using an online implementation are ease of access and centralized management. Coaches can access the software from wherever Internet access is available. Data updates and program upgrades can be performed with minimal downtime. The program was developed using the PHP programming language and the MySQL database structure during the course of a sixteen-week directed project. PHP and MySQL were chosen because they are powerful technologies, are completely free of charge, and are readily available.

Positron Emission Tomography

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Abstract

The research project created was done in order to discuss a particular imaging technology known as Positron Emission Tomography (PET). Many aspects of PET were included in. The research covered the history of PET from the 1950's, discussed the advantages and disadvantages of the radioactivity used in PET, as well as the various medical applications of the technology. PET was compared to other imaging techniques such as Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT), and was found to more accurate in diagnostic procedures than the two. The economic aspects and practicality of PET were also touched upon. Overall, PET was found to be an imaging technology with extensive benefits, drawbacks, and potential for increased application and use in the field of nuclear medicine.

**Post-Absurdism:
Ionesco and the Juxtaposition of Absurdism and Postmodernism**

Elizabeth B. Harbaugh
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Faculty Adviser: **Mark Duncan, M.F.A.**

Abstract

The purpose of this paper is to situate Eugène Ionesco's dramatic works within an historical, literary, and theoretical framework. By examining the influences of both absurdism and postmodernism on Eugène Ionesco's work, we can discern specific cultural and philosophical issues concerning Europeans, artists, and the general world population following the Second World War. Eugène Ionesco's works are ultimately extremely historically and theatrically significant and worthy of study, despite a contemporary distance from absurdism as a worthy field of study.

Potential Materials for Hydrogen Storage. Synthesis of Building Blocks for New Metal – Organic Frameworks

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Abstract

As reserves of fossil fuel become depleted the need for alternative sources of energy grow increasingly more important. The use of hydrogen gas as a fuel is one potential alternative energy source. However gases such as hydrogen are difficult to store and transport because even small amounts require a proportionately large amount of space. One way to combat this problem may be to create porous materials which may absorb large quantities of gas for storage in a much smaller space. MOF (metal-organic-framework) compounds have been demonstrated to have great potential as candidates for gas storage. MOF compounds are composed of building blocks linked together to form a framework with holes, where the hydrogen molecules can be stored. The building blocks are composed of organic molecules linked to metal atoms. Due to the ease of structural manipulation and predictability of void size, we are studying various metal complexes of BAII's (bis arylimino isoindolines). X-ray diffraction, infrared spectroscopy, melting point determination, elemental analysis, and nuclear magnetic resonance spectroscopy have been used to study the compounds. Specifically, here is the result for a copper complex with a particular BAII. This system has been shown to result in a molecular organic framework (MOF).

Recovery of Branching Coral in Devil's Crown, Galapagos Islands, Following El Niño Impacts

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Faculty Advisor: **Dr. Joshua Feingold**

Abstract

In 1982-83 a severe El Niño-Southern Oscillation (ENSO) event killed 95% of the scleractinian coral in the Galapagos Islands, Ecuador, with over 99% coral mortality reported at the study site, Devil's Crown. Also at this site, a reef composed primarily of the branching coral *Pocillopora* spp. was lost from primary and secondary biological disturbances associated with ENSO. For the subsequent 11 years *Pocillopora* was not observed there, however 5 colonies were seen in May, 1995. The number and size of colonies was monitored from 1995-2004. Projected surface areas were determined using two methods: direct measure during snorkel surveys using a ruler to measure maximum width and length (1995-2003), and digital photography was used in 2004 to obtain 2-D images. These images were converted to surface area using the program CPCe. *Pocillopora* colony number increased from 5 in 1995 to 64 in 2004, with colony surface area increasing from 849 cm² to 19,058 cm² over the same period. These data document a recent substantial increase in *Pocillopora* colony number and surface area suggesting that it may once again attain population densities sufficient to form reef structures in the Galapagos archipelago.

Revisited: A True Story

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Abstract

The film project is based on a true story about a young boy who was kidnapped. In this film, we revisit the incident and see it in a newer light which shows both what happened and what the boy saw happened. Revisited is exactly that, a film about a boy revisiting the incident in which armed men took him for ransom for a few hours before he was rescued by the SWAT team of Trinidad. He is en route to school when two cars block his car off; they pull him into another vehicle. They knock him unconscious and shoot his driver in the leg. They are transported to an abandoned location where he is to be tortured until the ransom is paid- but moments before arriving at the warehouse, he is rescued by a team of elite police mercenaries dressed as a national SWAT team. Here is his story...

Seeing it Through: An Overview of Retinal Degeneration and Future Treatments

Michael Au

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Faculty Advisor: **Dr. Emily Schmitt**

Abstract

Degenerative retinal diseases are, to date, largely untreatable – a shortcoming born of the complexity of the nervous system and our finite understanding. Retinitis pigmentosa (a group of inherited eye disease of the retina) scuttles about the family tree relatively unchecked, slowly and silently impairing vision in 1.5 million people worldwide. Comparatively, macular degeneration, an age-related kin of retinitis pigmentosa, afflicts sufferers on a magnitude of roughly 20 diagnoses per hour within the United States alone. Such degenerative diseases almost always culminate in the death of rod and cone photoreceptor cells along with the accompanying loss of visual capacity. This literature review primarily focuses on the adaptation of three specialized cell types that have yielded promising results in the direction of retinal repair. Not unlike other proposed nervous system repairs, the ubiquitous embryonic stem cell has demonstrated its value as a prospective contributor towards the development of photoreceptors in a controlled environment. Additionally, as the long speculated factor underlying fish retina regeneration, Müller glial cells have shown a competency to restore damaged retinal neurons. More recently, researchers have also uncovered the significance of photoreceptor precursors in mouse models of degenerating retinas. As continuing studies of these particular cells are underway, it is with certain hopefulness that innovative therapies will take form and inaugurate the beginning of restored sight.

Stress is Related to Sleepiness in NSU Undergraduate Students

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

Abstract

College students often suffer from chronic sleep restriction and up to one third of college age adults suffer from excessive daytime sleepiness (EDS). The finding that high numbers of college students experience EDS is very problematic as this is a population that uniquely requires optimal cognitive functioning to successfully complete course material. One possible cause of EDS from chronic sleep restriction in college students is the high levels of stress experienced by this population. In fact, changes in the stress-related hormone, cortisol, have been previously shown to greatly affect sleep in clinical populations. Here, we hypothesized that subjective levels of stress would positively correlate with subjective reports of chronic sleep restriction in NSU undergraduate students. Participants completed two previously validated self-administered surveys. The first survey was the Perceived Stress Scale which uses a rating system measure of the degree to which situations in a person's life are perceived as stressful. The second survey was the Epworth Sleepiness Scale which provides an assessment of a person's subjective sleepiness level. The data indicate that large amounts of stress experienced by college students leads to poor sleep habits and chronic sleep restriction. The results provide important information in understanding the complex relationship between stress and chronic sleep restriction in NSU undergraduate students.

Synthesis of New Ruthenium (II) Complex with a Long Excited State Lifetime for Its Use as a DNA Probing Biosensor

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Faculty Sponsor: **Dr. Dimitrios Giarikos**

Abstract

Due to the degree of instrumentation needed for DNA diagnostic and colorimetric procedures, it has become considerably expensive for the public and independent laboratories to conduct research on genetic diseases and to probe DNA. Even though myriad technologies are available for detection and measurement of modified target molecules, cell and DNA probing techniques are involved and complex processes. Current methods of chemiluminescence by metal-ligand complexes (such as those with ruthenium) have proven to be ineffective because luminescent lifetimes are extremely short. Hence, the primary focus of this research is to synthesize novel ruthenium-ligand complexes that will have enhanced emission lifetimes. The research in progress has involved the examination of spectrometric properties of the starting ruthenium complexes and ligands of interest; namely, $\text{Ru}(\text{acac})_2(\text{CH}_3\text{CN})_2$, $\text{Ru}(\text{acac})_2\text{bipy}$, 4,4'-bis(cyanomethyl)-2,2'-bipyridine, and 4,4'-Bis(cyanomethyl)-2,2'-bipyridine. Future research will involve the synthesis of new metal-ligand complexes via the incorporation of the ruthenium complexes and ligands previously mentioned. It is expected that the newly synthesized complexes will serve as a conduit through which electrons may flow; therefore, they will possess the capability to serve as biological markers. DNA may react favorably with these complexes because it has excellent electron conducting capabilities and provides a 'circuit' through which electrons from the complex may flow. Since the new ruthenium-ligand complexes will be synthesized to have an enhanced emission lifetime, intercalation with DNA will be more easily observed with the naked eye without the use of extensive instrumentation. Such interactions with DNA and other molecules will allow various reactions and modes of binding to be observed during the design and development of new drugs, synthetic restriction enzymes, DNA foot printing, and DNA diagnostics.

Thank God for AIDS: Persistent Stereotypes in U.S. Network Television

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Abstract

This paper explores the use of stereotypes to characterize homosexuals on network television in the United States. With a goal of raising reader awareness of network television's over-reliance on stereotypes, I also argue that the stereotypical depictions of homosexuals on network television has negative and sometimes even dangerous ramifications in contemporary U.S. culture.

Many argue that the increasing number of gay and lesbian characters featured on network television is an indication of society's emerging acceptance of homosexuality. However, this is a false assumption given that many of the shows cited as promoting equality are not meant to do that, but instead are created to improve network reputations, address current controversial issues, and ultimately boost ratings. Stereotypes have long been employed to assist networks in reaching these goals. In terms of sexuality, networks often use common stereotypes such as the portrayal of gay men as feminine and flamboyant and the depiction of lesbians as more masculine.

The creation of characters such as Jack McFarland of NBC's Will and Grace and the cast of Queer Eye For the Straight Guy is a prime example of network television's critical role in the reinforcement of stereotypes. While the existence of homosexual characters on television is certainly not harmful, using stereotypes in their depiction ultimately has negative implications including limiting viewers' perspectives and encouraging further stereotyping, discrimination in various forms, and, in extreme cases, perhaps even violence.

The American Dream: Support the Dream Act

Myra Rafi

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Abstract

Every day, many young and eager students face barriers to obtaining a college education. They are prohibited from working, driving, and applying for the financial assistance that so many other young, soon-to-be college students can have. Unfortunately, this is the life many undocumented students lead. After graduating from high school, these students have no options for working toward the futures they have dreamt of. However, there is an option, a prospect that may help them to achieve their dreams: it is the Development Relief Education for Alien Minors Act: the DREAM Act. This bipartisan legislation was proposed by no less than six senators and congress people in the years 2005 and again in 2006. Currently, the DREAM Act is pending in Congress and desperately needs support. The DREAM Act will eventually lead these young adults to a haven of U.S. Citizenship and will offer them important opportunities. This paper discusses how the DREAM Act will improve the lives of young, deserving, but undocumented, Americans and how the act also will be extremely beneficial for our country and its citizens. The goal of this essay is to inform the citizens of the United States about the injustice faced by young, undocumented Americans. Furthermore, this essay aims to convince others that it is vital to stand up and take action immediately to support this bill so it is implemented as a law. The DREAM Act has the power to transform the lives of thousands of despondent students all across the United States. It's time to break the barriers of injustice.

The American Psyche of the 1900s: A Nation in Disappointments

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Faculty Adviser: **Dr. Christine Jackson**

Abstract

There is a psychological mind frame that persists where the American dream is pursued. Disappointments are a part of American life, both in the 1900s and today. In Glaspell's *Trifles* and William's *The Glass Menagerie*, each character in society portrays the American Psyche and different methods to cope with disappointments. From the disillusionments of war to the unrealistic expectation of parental units, both works display issues of the psychological mind in 1900 American Literature. Multiple perspectives of coping show how the psyche reacts to lack of feminism and failed expectations; responding to the struggles is unique and defines the crushed Modernist mind of the 1900s.

The Arguments of Abortion: An Analysis

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Abstract

Since 1973, with the decision to legalize abortion in the landmark case of Roe v. Wade, America has hotly contested the question: Should abortion be legal practice? The debate of this question has spawned controversy, violence, and political concern. Although a majority of people agrees that abortion should be permissible in some cases – such as in situations when the mother is a victim of rape or incest, or if an abortion would be of extreme benefit to the mother’s health – the issue divides vastly on the use of abortion for any other reason. With the debate having raged on for more than 30 years, the opposing sides have managed to condense their common arguments and reasoning into several points. Some of these are solid and thought provoking, while there are at times some that are illogical, uninformed, or easily (or not so easily) refuted back and forth and back again, as analysis will present.

The Ballerina in the Box

Amy Harvey

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Faculty Sponsor: **Dr. James Doan**

Abstract

When read for the first time, this poem seems to be about one of those beautiful little jewelry boxes little girls receive as a gift from a loved one; the kind that have a spinning plastic ballerina in them. However, at second glance the reader might notice that it is actually about the insecurities of being alone. This poem is an allegory of an experience of its author.

The Effect of Dimethyl Sulfoxide (DMSO) on the Growth of A2780 Cancer Cell Line

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College of Pharmacy

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Abstract

Dimethyl sulfoxide (DMSO), a by-product of the wood industry, has been in used as a commercial solvent since 1953. It is also one of the most used but least understood pharmaceutical agents of our time. In the United States, DMSO has Food and Drug Administration (FDA) approval only for use as a preservative of organs for transplant. In the research laboratories DMSO is commonly used as a vehicle to solubilize and water insoluble drugs and to increase the membrane permeability of drugs during *in vitro* treatments. In cell culture laboratories DMSO is also used as a cryoprotectant to help protect the cells from dehydration and rupture by the formation of ice crystals. The most commonly used concentration of DMSO for cryopreservation is 10%. We accidentally discovered the cell growth arrest and apoptotic ability of DMSO on A2780 ovarian cancer cells during one of our cell culture experiments. In order to further explore the cell growth arrest ability of DMSO we conducted several experiments. When A2780 cells were incubated with increasing concentrations of DMSO, ranging from 0.5% to 8.0%, for up to 6 days interesting findings were obtained. It was quite obvious that DMSO was able to produce significant cytostatic effects on the ovarian cancer cells at lower concentrations while at high concentrations it produced apoptotic effects. Some of these findings are consistent with the observations reported by other laboratories which have looked at the effect of DMSO on the cell growth, and changes in the cells morphology. Our experiments went far and beyond assessing the cell growth in the presence of DMSO, we analyzed the expression of a critical gene and gene protein that are related to cell cycle progressions. Our findings clearly indicate the ability of DMSO to induce dual effects on ovarian cancer cells. (This research was supported by the PFRDG grant of NSU)

The Effects of Academic Stress on Immune Functioning

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

Abstract

Stress associated with academic examinations is thought to cause immunosuppression in students. However, it is currently unclear whether the immunosuppression associated with academic pressure is related to increases in the stress hormone, cortisol. Indeed, it is possible that factors independent of cortisol may control the emotional and immune response. In the current study, we were interested in untangling the complex relationship between academic stress and immunosuppression through comparing both subjective and objective measures of academic stress and immune functioning. Students were assessed before, during, and after an academic examination period. During each assessment, self-reported subjective reports of stress were collected through the use of The Perceived Stress Scale. We assessed self-reported subjective reports of academic examination stress through the use of The Academic Pressure Survey which was designed by the authors of this study to quantify the academic pressure experienced by students in a given week. In order to quantify objective measures of stress and immune functioning, salivary samples were collected for the quantification of cortisol and Secretory immunoglobulin A (S-IgA) levels, respectively. Preliminary data suggest that overall, family support decreases reported stress levels in students. During an examination period, both time spent studying and the belief that the exams would impact the students' future resulted in increased reported stress levels.

The Effects of Zinc on Gene Expression in *Saccharomyces cerevisiae* using Polymerase Chain Reaction (PCR) for Six Candidate Genes

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Faculty Advisor: **Dr. Emily Schmitt**

Abstract

In this experiment the effects of various concentrations of zinc on *Saccharomyces cerevisiae* will be investigated using Polymerase Chain Reaction (PCR). Zinc (Zn) is one of the most naturally occurring elements. It is an important integral cofactor for many cellular activities. Zinc participates in all major biochemical reactions such as transcription of DNA and translation of RNA. More than three hundred enzymes require zinc for their catalytic function. *Saccharomyces cerevisiae* strain S288C is a species of budding yeast. It is the most intensively studied eukaryotic model in molecular and cell biology. The mRNA from these yeast cells grown in different concentrations of zinc (0 μ M, 1 μ M, 50 μ M, 1mM) will be reviewed to determine the expression of patterns specific genes. In particular, the expression of six genes ZRT1, ZRT2, ZRT3, ZRC1, ZAP1, and VEL1 will be examined. The yeast will be grown in CSD media with the appropriate concentration of zinc. Zinc will be added as zinc chloride. A control sample will be grown without the addition of zinc chloride. The 1mM zinc is considered to be an excess amount, while 1 μ M is considered to be less than the minimum required Zn concentration. RNA will be isolated from yeast exposed to each environmental condition. The mRNA from the total RNA extracted will then be converted to cDNA, and the presence of the various genes will be tested using specially selected primers and polymerase chain reaction (PCR).

The Formation of a New Gadolinium Dendrimer and its Potential Use as an MRI Contrast Agent

Karoline Korah

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Farquhar College of Arts and Sciences

Faculty Sponsor: **Dr. Dimitrios Giarikos**

Abstract

The search for a magnetic resonance imaging (MRI) contrast agent that enhances the images of the body's bloodstream, tissues, or organs is currently continued. There are several known gadolinium compounds that are used as MRI agents. The use of dendrimers as an MRI contrast agent is being investigated, but the recent focus on the applications of dendrimers allows much of the developments of research to be fairly new. This research project will involve creating a new gadolinium compound and studying the possibility of using it as an MRI contrast agent. In this research project, several compounds have been synthesized. This includes the $Gd(acac)_3$ where $acac$ = acetylacetonate, a porphyrin (5,10,15,20-tetrakis(4'-chlorocarbonylphenyl)porphine), and compounds which combined a generation two (G2) dendrimer and the porphyrin (under nitrogen and another exposed to the air). These compounds are currently being analyzed through IR spectroscopy. They will be analyzed by elemental analysis (EA) and nuclear magnetic resonance (NMR) spectroscopy. Further study will be conducted for the reactions of the gadolinium to the dendrimer and the porphyrin compound. Additionally, the gadolinium compound will also be reacted directly to the G2 dendrimer and the compound will be analyzed.

The Rising Cost of Obesity in the United States

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School of Business

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Abstract

The purpose of this study is to determine to what extent the costs of obesity have increased over the past decade within the United States. Data implies that obesity has undergone a rapid increase among the U.S. population resulting in significant escalation of health care spending. The studies reviewed focused primarily on obesity as it relates to age, race, gender, as well as the veteran population. The research focused on the effect of obesity-related illnesses such as diabetes, dyslipidemia, and hypertension among these groups. Studies suggest that health care intervention at an early stage can have a significant impact on both short term and long term outcomes. Veterans who use the VA Puget Sound Health Care System were found to have higher rates of obesity when compared with veterans who did not use the Puget Healthcare program. Obesity accounts for nearly 6% of national health expenditures in the United States compared to only 3% in other countries for which estimates have been reported. It has been concluded that health care costs associated with obesity are substantial and vary according to race and age.

The Role of Chaperones in Prion Infection

Perna Alfa Thomas

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Faculty Advisor: **Dr. Emily Schmitt**

Abstract

Prions are infectious proteins that cause neurodegenerative diseases called transmissible spongiform encephalopathy which affect several species, including humans. Chaperones are molecules that bind to the nascent peptide chain and fold the polypeptide chain into its secondary or tertiary structure. Prions affect the protein folding machinery or molecular chaperones of the cell which might lead to the formation of aggregates. The goal of this literature review is to highlight several functions of chaperones in prion infection, to draw attention that prions could be misfolded molecular chaperones, and to indicate the therapeutic applications of chaperones in prion infection.

Chaperones may perform a variety of functions in prion infection. Chaperones like Hsp104 and Ssa (from Hsp70 family) may promote prion aggregation in *Saccharomyces cerevisiae*. The over expression of chaperones such as Hsp104, Ssa1, and Ydj1p, inhibits prion propagation. Ssb, chemical chaperones, and chaperones found in *E. coli* also prevent prion growth. Chaperones such as GroEL and Hsp104 can make normal cellular prions resistant to protease activity and prevent the proteolysis of prion proteins. However, some chaperones such as BiP can interact with misfolded or abnormal proteins and recruit these proteins for proteosomal degradation. By comparing the properties of molecular chaperones and prions, it can be inferred that prions could be misfolded chaperones. Since chaperones play a crucial role in prion propagation many chaperones can be used as targets for therapeutic applications.

The Synthesis of Building Blocks for Metal-Organic Frameworks (MOF): Potential for Gaseous Fuel Storage

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Abstract

There is currently considerable interest in the use of hydrogen as an energy transport medium. While hydrogen provides clean combustion, storage and transport raises complex engineering challenges, resulting in potentially expensive design restraints. Current research indicates that transition metal complexes of mononucleating ligands, such as 1,3-bis(pyridylimino)benz(f)isoindoline (NBAlI), spontaneously form uniform channels in the crystalline matrix that may be suitable for hydrogen storage. Furthermore, the alteration of the ligand substituents may yield the ability to tailor the shape and size of the crystalline channel to optimize the geometric configuration. Specifically, the x-ray crystallography of the divalent copper complex of NBAlI indicates that longitudinal channels form during crystallization, which measure 12 angstroms by 7.5 angstroms, providing ample volume for hydrogen packing, the characterization of which is ongoing.

Third-Wave Feminism in Legally Blonde

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Abstract

Both Amanda Brown's novel, *Legally Blonde*, and the film version based on her chick-lit book, emphasize key elements of feminism and seek to empower women. *Legally Blonde* exemplifies the "strand" of feminism known as the "third-wave" (Dole 87). Third wave feminists seek to reclaim their femininity, and as Carol M. Dole put it, "reclaim pink" (89). The film and novel portray the epitome of a true third-wave feminist, Elle Woods (Reese Witherspoon). She is a woman who proudly flashes her girlie appearance, refuses to conform to society's expectations of women, achieves greatness through her determination and diligence, and celebrates the power of being a blonde in pink. *Legally Blonde* upholds the theme of girl-power, proving that a woman can be feminine and still be intelligent and successful in whatever she chooses to do.

Using Microarray Technology to Examine the Effects of Zinc on Gene Expression in *Saccharomyces cerevisiae*: A proposal

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Abstract

Zinc is one of the principle trace elements required in biological systems, with structural or enzymatical roles in hundreds of proteins. In humans, zinc deficiency has gradually come to be recognized as a clinically significant and common form of malnutrition, particularly in chronically ill patients. The clinical manifestations of zinc deficiency are diverse with effects on the immune system, appetite, and embryonic development. The regulation of zinc distribution remains a critical, unanswered question. The manner in which zinc is released from its tight binding sites in proteins and its transfer from one site to another are also unknown. While several studies have examined gene expression of a few genes in response to zinc (Zn) exposure, there are a lack of data concerning how an entire genome responds to the presence of Zn. In this study, microarray technology will be used to examine the potential effects of Zn exposure (0 μ M, 1 μ M, 50 μ M, 1mM Zn solutions for 60 hours) on gene expression in *Saccharomyces cerevisiae* (yeast), a model organism that shares roughly 31% of its genome with humans. Changes in gene expression will be analyzed using MAGICTool, a software developed through the Genome Consortium for Active Teaching (GCAT). Variability within and among microarray slides will be specifically addressed by examining expression patterns on slides that received the same control treatment (0 μ M Zn). Subsequently, genes will be identified as being down or up-regulated in the various zinc conditions.

Using Various Visual Census Techniques to Assess Fish Assemblages on Nearshore Habitats off Lantana Beach, Florida

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Faculty Advisor: **Dr. Paul Arena**

Abstract

The nearshore environment off southern Palm Beach County is characterized by extensive areas of hardbottom, primarily composed of limestone beachrock and *Sabellarid* worm reefs. These substrates are located very close to shore in the surf zone, an area of high wave action, and provide habitat to a wide variety of fish species. These habitats are ephemeral and cycle through burial and exposure events over time due to shifting sand from nearby beach renourishment projects. One goal of this study is to determine the species composition and abundance of this fish assemblage using various visual census techniques. We will be trained by Dr. Arena to identify fish species which typically inhabit these areas, as well as estimate their size. We will be utilizing and comparing three census methodologies: transects, point-counts, and rover. We will also compare censuses completed by SCUBA divers versus snorkelers. Another goal of the study is to determine if there are tidal and seasonal changes in the fish assemblages at these sites. The nearshore environment off Lantana Beach, Florida will be the study site for this research project. The hardbottom habitats will be assessed before the project begins to determine areas of worm reef versus limestone beachrock. Random sites within each of these substrates will be chosen to complete the visual techniques and the fish assemblages residing on each of these two substrates will also be compared. Previous studies have indicated these nearshore habitats are important nursery grounds and this study will provide additional data on these habitats.

Utilization of Passive Acoustic Tracking to Determine Artificial Habitat Use and Movement of Nurse Sharks, *Ginglymostoma cirratum*

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Abstract

The ecological characteristics of many cryptic and evasive marine vertebrates, such as sharks, are widely unknown, largely, due to the inability to efficiently monitor and track them over extended periods of time. Recent advances in ultrasonic acoustic telemetry now allow scientists to collect data on these highly elusive predators more efficiently than ever before. Marine animals, such as the nurse shark, *Ginglymostoma cirratum*, have been observed at artificial reefs, such as sunken vessels, but how long they spend at or near these habitats is unknown. This research aims to determine the habitat use of the nurse shark, *Ginglymostoma cirratum*, at specific artificial reefs, vessel-reefs, and adjacent natural reef areas off Broward County, Florida. Nurse sharks will be captured and an internal radio transmitter will be surgically implanted. VEMCO receivers will be strategically deployed around sunken vessels and natural reefs to create a passive acoustic array or network, which will detect the acoustic pulses from the transmitters when in range. This will allow continuous observations of a number of sharks in a non-invasive manner, and will provide information on their natural behavior and movement patterns.