

## PHYSICAL SCIENCES AND MATHEMATICS

**Section A: 8:30-9:30**

**Session 1: UC 201**

**Physical Sciences and Mathematics I - ePoster**

### **Undergraduate Division**

**Name:** Muhammad Aziz

**Title:** *Developing new methodologies to prepare optical holograms employing diode lasers*

**Faculty Advisor(s):** Dr Gottipaty Rao

**Abstract:** Developing new methodologies to prepare optical holograms employing diode lasers.

Traditionally, He-Ne lasers are used to prepare optical holograms. He-Ne lasers provide monochromatic beam with large coherence length which is well suited for optical holography work. The larger the coherence length of the laser, the larger will be the depth perspective in a hologram giving an impressive three dimensional view of the object.

We are investigating the possibilities of employing diode lasers to prepare quality optical holograms. Diode lasers are low cost, highly efficient and require low power and can be operated by batteries, and compact. The diode lasers offer diffraction-limited point beam and hence can be employed without beam expanders or spatial filters. The suitability of diode lasers for holography applications depend on whether the diode laser operates in single frequency or in multi-mode. Single frequency diode lasers are better suited for holography work because they will have larger coherence length. We have setup a long arm Michelson interferometer to measure the coherence of diode lasers. The coherence length of several diode lasers (Fabry-Perot diode lasers, distributed feedback (DFB) diode lasers) are being measured since this data are currently not available. Several multimode, single frequency and DFB lasers are investigated and their coherence length and the frequency bandwidth of the output measured. The diode lasers are employed to prepare high quality holograms and the measured depth perception of the holograms is correlated with the coherence length of the diode lasers.

The present work will develop new techniques and methodologies in optical holography employing diode lasers.

**Name:** Diana Chaykina & Sophia King

**Title:** *Electrochemical and Photoelectrochemical Investigations Of Gc/Pin-5-CooH/Cds/Tyrosinase System for The Catalysis of Redox Reactions in Phenolic Compounds*

**Faculty Advisor(s):** Dr. Magdalena Osial, Dr. Justyna Widera, Prof. dr. hab. Krystyna Jackowska

**Abstract:** The detection and quantification of "phenolic compounds" is of great interest due to the uses of these compounds. Phenol is a known contaminant in many fields such as the environment and industrial wastes and can be converted to catechol in the presence of oxygen and tyrosinase<sup>1</sup>. In this study, the redox reaction of catechol was observed on an electrode modified with a hybrid system consisting of poly(indole-5-carboxylic acid), cadmium sulphide (CdS), and tyrosinase. Such redox reactions are difficult to monitor using bare electrodes due to the formation of phenoxy radicals, which create a nonconductive film over the electrode.<sup>2</sup> Therefore, there is a need to develop hybrid modified electrodes that protect the bare electrode while at the same time catalyzing the redox reaction of interest. Many researchers have begun to look into conductive polymers for this purpose, one of them

being poly(indole-5-carboxylic acid)<sub>2</sub>, which functions as a conductive polymer while also providing a functional group onto which an enzyme (such as tyrosinase) can attach<sup>3</sup>. It was seen that the addition of the polymer and the enzyme did in fact catalyze the redox reactions of catechol.<sup>2,3</sup> Cadmium sulphide was added to the hybrid in order to check if the hybrid system would be photoactive. It was found that the enzyme did not lose catalytic activity while being illuminated with a Xenon lamp. The addition of CdS nanoparticles to the GC|PIN-5-COOH|TYR system produced slightly smaller but more stable currents under illumination, which caused the variation of the catechol quantitation limits: a) GC|PIN-5-COOH|TYR electrode (2.5 $\mu$ M to 0.13mM) and b) GC|PIN-5-COOH|CdS|TYR electrode (2.5 $\mu$ M to 0.34mM).

[1] Rajesh; Takashima, W.; Kaneto, K. *Sensors and Actuators B*. 2004, 102, 271-277.

[2] Bieganski, A.; Frydrychewicz, A.; Osial, M.; Jackowska, K. *Russian Journal of Electrochemistry*. 2010, 46, 1297-1305.

[3] Bieganski, A.T.; Michota, A.; Bukowska, J.; Jackowska, K. *Bioelectrochemistry*. 2006, 69, 41

**Name:** Tanner Grogan

**Title:** *Laser Frequency Stabilization of an External Cavity Diode Laser toward studying Ultracold Collisions with Frequency Chirped Laser Light*

**Faculty Advisor(s):** Matthew Wright

**Abstract:** We will discuss our progress toward coherently controlling ultracold collisions with frequency chirped laser light on a nanosecond timescale. We have shown that chirp rates greater than 1 GHz in 20 ns can lead to coherently controlling the trajectories of colliding atom pairs over a large range during a collision. We will discuss our progress toward illuminating ultracold atoms with detuned frequency chirped laser and measuring the inelastic collisional rate from trap loss from a magneto-optical trap. As part of this work, we are implementing standard techniques for stabilizing the frequency of an external cavity diode laser by referencing its frequency to a saturated absorption peak in a room-temperature gas cell.

**Name:** Victoria Grover

**Title:** *Study on the Deterioration and Possible Renewal of an Earth-Fill Dam*

**Faculty Advisor(s):** Dr. Matthew Wright

**Abstract:** Low hazard dams are often found on private properties, holding back small ponds or streams in order to create a freshwater environment for native species. One such dam exists alongside Sunset Road in the Westerlo township of Albany County, New York (42.43°, -74.09°) and was built to contain a small, man-made pond. This dam has suffered deterioration throughout its life because of its composition, as well as its geographic placement. In recent years, it has begun to leak more actively, jeopardizing both the stability of the structure, and the existence of the pond that it contains. We conducted a comprehensive study in order to assess the amount of dam deterioration, its causes, and the possible methods that can be implemented to ensure its continuing stability and usage. We have completed the initial phase of the project which has shown that there are several serious causes of dam deterioration taking place including multiple sites of leakage in the dam, differential settlement and ground subsidence problems, and a reduced inflow of water to the pond. Several methods for combatting these events will be explored, as well as an investigation into what other experiments must necessarily be conducted in the future to better understand the environmental and structural dangers affecting the dam.

**Name:** Jasmine John

**Title:** *Exploring the World through the Combinatorial Trace Method*

**Faculty Advisor(s):** Dr. Branden Stone and Dr. Sarah Wright

**Abstract:** The Combinatorial Trace Method is a way to express equalities between combinatorial expressions and power sums. The method relies on the interplay of concepts from many areas, including linear algebra, graph theory, and combinatorics, and thus use of the method can lead to new results in a variety of fields. In the paper *The Combinatorial Trace Method in Action* by Mike Krebs and Natalie C. Martinez (California State University, Los Angeles), the authors apply the Combinatorial Trace Method to give further insight into Fibonacci-like sequences and the familiar Pascal's triangle. Expanding on this work, we pose questions concerning combinatorial equalities and their corresponding graphs, along with the power sums representing them. For example, given a sequence, can a corresponding graph be found? Given a graph, is it possible to extract combinatorial expressions or power sums, based off the number of vertices and edges present? Given a matrix, what can we learn about its corresponding graph?

**Name:** Enoch Kim

**Title:** *Beginning the Synthesis of  $\pi$ -N-Methyl Impropgan*

**Faculty Advisor(s):** Dr. Melissa Van Alstine-Parris

**Abstract:** Impropgan is an analgesic drug that appears to have strong pain relieving properties. Distinct from opiate drugs like morphine, impropgan lacks the addictive and tolerance properties making it an ideal pain relieving drug. Due to the fact that impropgan does not cross the blood brain barrier, impropgan must be administered directly into the brain of laboratory animals. The goal of this research is to modify impropgan by methylating the  $\pi$  nitrogen on the imidazole ring. This will make the compound have less hydrogen bond donors and lower the polarity of the compound which may enable it to cross the blood brain barrier. A proposed seven step scheme, starting with commercially available urocanic acid was initially carried out to synthesize  $\pi$  N-methyl impropgan. In the process, complications arose as the imidazole ring underwent tautomerization. Depending on which of the two tautomer undergoes methylation, two products can be formed. The methyl group can be attached to either the  $\tau$  nitrogen or the  $\pi$  nitrogen. To circumvent this problem, a new scheme was proposed, where a protecting group will be added to the  $\tau$  nitrogen, forcing methylation to occur on the  $\pi$  nitrogen.

**Name:** Angelica Leonardo

**Title:** *Synthesis of 1-methyl benzimidazole derivatives for uridine nucleoside ribohydrolase targeting*

**Faculty Advisor(s):** Professor Melissa VanAlstine-Parris

**Abstract:** *Trichomonas vaginalis* is the parasitic agent responsible for trichomoniasis, a common non-viral sexual transmitted disease of worldwide importance. This parasitic infection is normally treated with 5-nitroimidazole drugs which target the parasite's DNA. However, the parasite has developed resistant strains against these drugs and, as a result, a new treatment that works different than the current drug of choice is needed. Castillo et al. reported that benzimidazole derivatives can act as good antiparasitic agent; some of them are even more active than 5-nitroimidazole drugs when tested for antiprotozoal activity. Stockman et al. identified that proton-pump inhibitor drugs, containing benzimidazole scaffolds, inhibit one of the parasite's enzymes needed for survival, uridine nucleoside ribohydrolase (UNH). For a better understanding on how benzimidazoles affect the parasite, 5,6-dichloro-1-methyl benzimidazole derivatives substituted at position 2 with aminocarbonyl, N-methylaminocarbonyl or N,N-dimethylaminocarbonyl are being synthesized following a series of four different reaction. The first reaction consisted in the making of the benzimidazole backbone via the Phillips cyclocondensation, giving a yield of 85%. The second step of the synthesis, the oxidation of a

primary alcohol to an aldehyde, is currently in progress. This will be followed up with methylation of one of the N atoms from the benzimidazole. Lastly, the final products will be obtained via an oxidative amidation of the benzimidazole product with the proper amino group. Once these three compounds are synthesized, they will be tested for their inhibitory effects on the enzyme rather than testing them with the whole parasite. If these compounds are found to show a similar profile towards UNH as the parasite, it would help support our hypothesis that these benzimidazoles work as antiparasitic agents by inhibiting UNH.

**Name:** Tian Li

**Title:** *Reactions of Hypervalent Iodonium Alkynyl Triflate and Trimethylenemethane: Generation of Substituted Diquinanes*

**Faculty Advisor(s):** Dr. Ivan D Hyatt

**Abstract:** Iodine is often found in its monovalent oxidation state for most compounds, but when it is in the oxidation state of three or five, it is considered to be hypervalent. Hypervalent iodonium alkynyl triflate (HIAT) is a hypervalent iodine complex in the third oxidation state that can be used as a reagent in synthetic chemistry. The unique reactivity of HIATs make them suited to efficiently generate trimethylenemethane (TMM) intermediates that can result in substituted diquinanes; biologically relevant molecules found in nature. The purpose of the research is to discover a new methodology that will allow chemists to synthesis complex molecules with low cost and ease of access. Once the methodology has been developed, it can be used in areas such as material science and pharmaceutical drug design.

**Name:** Marly Medard & Kirandeep Kaur

**Title:** *Synthesis of light emitting Cycloheptatrienyliidene complexes using metal induced aggregation*

**Faculty Advisor(s):** Professor Ivan Hyatt

**Abstract:** Fluorophores lose their efficiency of luminescence in concentrated solutions due to static and dynamic quenching and makes solid state applications difficult. To avoid the detrimental quenching a light emission when in concentrated solutions, a new strategy will be investigated. In certain situations, aggregation, the clumping of molecules, restricts static quenching by inhibiting intramolecular rotation while the addition of a metal can restrict dynamic quenching by eliminating self-absorption. The goal of this project is to synthesize asymmetrical cycloheptatrienyliidene fluorophores and react them with a metal to monitor the phenomenon of aggregation induced emission. The synthesis will react various nucleophiles with hypervalent iodonium alkynyl triflates to quickly access many combinations of fluorophores. This novel means of synthesizing the target molecule will help discover how the structure affects aggregation and subsequent fluorescence. In the future, the objective is to create a molecule that fluoresces after interacting with metals found in body.

**Name:** Noor Meer

**Title:** *Synthesis of Light-Emitting Fluorophores*

**Faculty Advisor(s):** Dr. Dempsey Hyatt

**Abstract:** Metal initiated aggregation induced emission of cycloheptatrienyliidene substituted fluorophores could be the next step in targeting malignancies. The long-term goal of this project will be to produce molecules that aggregate and emit light by fluorescence after coming into contact with metals commonly found inside the body. The cycloheptatrienyliidene fluorophore will be synthesized by reacting a nucleophile with a hypervalent iodonium alkynyl triflate. Once synthesized, the fluorophore

will be reacted with various metals to monitor the effects. It is predicted that aromatization of the cycloheptatrienyliene will cause aggregation and turn on the light-emitting fluorescence as the molecule undergoes a restriction of intramolecular rotation. The main focus of the initial stages of the project will be to fluctuate the HIAT and nucleophiles so diverse structural combinations of fluorophores can be synthesized.

**Name:** Ivan Miketic

**Title:** *Design and Fabrication of a Portable Sensor for Monitoring Ambient Nitrogen Dioxide with High Sensitivity and Specificity*

**Faculty Advisor(s):** Dr. Gottipaty Rao

**Abstract:** Nitrogen dioxide has multiple adverse impacts on the environment and public health. It plays an important role in the formation of photochemical smog and tropospheric ozone, contributes to acid rain and is responsible to several other adverse effects. The EPA has recently issued new NO<sub>2</sub> air quality standards<sup>9</sup> which in particular, set limits on short term and long term exposure to NO<sub>2</sub>. The EPA also mandated monitoring of NO<sub>2</sub> at heavy traffic areas and major intersections. Anthropogenic nitrogen dioxide is primarily produced as a result of the combustion process. The most dominant of the moving sources by far is the automobile, which produces about 60% of all anthropogenic NO<sub>2</sub> emissions.

We developed a monitor that can directly measure NO<sub>2</sub> levels with high specificity, at ppb levels, in real time using a multi-mode diode laser and multiple line integrated absorption spectroscopy coupled with cavity enhanced absorption spectroscopy. We also employed cavity enhanced absorption spectroscopy that enhances the sensitivity of the detector by providing a pathlength on the order of 1 km in a small volume. Off-axis alignment excites a large number of cavity modes simultaneously, thereby reducing the detector's susceptibility to vibration. Multiple line integrated absorption spectroscopy (where one integrates the absorption spectra over a large number of rovibronic transitions of the molecular species) further improves the sensitivity of detection. The experimental cell was a high-finesse optical cavity that was 20 cm long, and had mirrors with a reflectivity of ~99.98% at 405 nm and a radius of curvature of 1 meter. The data was processed with the help of LabView software and a computer.

Employing this technique we were able to achieve a sensitivity of 1 ppb for monitoring NO<sub>2</sub> in the atmosphere. Currently we are testing the unit for long term stability and redesigning the setup to be more compact, portable and free from vibrations.

**Name:** Sameer Murtaza & Nikolette DeBenedictis

**Title:** *Holography in Art and Archaeology*

**Faculty Advisor(s):** Professor Gottipaty Rao

**Abstract:** Holography provides a three dimensional real life like view of objects compared to two dimensional view of a photograph or an art work. Holography is playing an important role in the new art and design. Holographic private and public galleries and museums are in operation in major cities all over the world. The popularity of this area can be judged by the numerous successful "Holography, Art and Design" conferences held all over the world. We present a number of creative display reflection holograms prepared by us. We employ a variety of innovative techniques to get good perspective and visual effects. We present details of the experimental techniques employed for the preparation of the holograms. A number of transmission, and reflection holograms prepared will be displayed at the Adelphi Conference.

Holography is accepted as a standard research tool in archaeology. The holograms of the ancient

artifacts are prepared in three dimensions to provide traveling exhibitions in order to bring the ancient heritage to the people. Most of the major museums employ full-time holographers to record their treasures in three-dimensional form. We prepared reflection holograms of a number of objects to demonstrate the potential of the holography technique for exhibiting archaeology artifacts.

**Name:** Tara Pena

**Title:** *Raspberry Pi and Magnetic Field Readings*

**Faculty Advisor(s):** Professor Matthew Wright and Professor Eugenia Villa-Cuesta

**Abstract:** We are determining how magnetic fields affect the mitochondria of organisms using fruit flies as model system. Since we are exposed to changing electromagnetic fields, understanding the health effects mediated by alterations in magnetic fields can have important consequences for health. This may be of particular interest in space travel. As an initial test, we placed fruit flies in different magnitude of magnetic fields: zero, low, and high. In this presentation, we will discuss how we determine the stability of the magnetic field for the different environments using a Raspberry Pi b+ and a HMC5883l (magnetic compass).

**Name:** Deepsana Shahi

**Title:** *PS-CRDS*

**Faculty Advisor(s):** Professor Gottipaty Rao

**Abstract:** Detection of trace species with high sensitivity and specificity has numerous applications such as monitoring atmospheric pollutants, studying the complex chemical reactions, noninvasive medical diagnostics such as breath analysis, detection of improvised explosives, detecting trace impurities in the semiconductor industry, and optimizing combustion processes and minimizing emissions to name a few. For these applications, one needs high sensitivity and high specificity of detection because the concentrations of the trace species are in the parts-per-billion (10<sup>9</sup>) to parts-per-trillion (10<sup>12</sup>) levels.

We developed a sensor for monitoring NO<sub>2</sub> in the atmosphere with high sensitivity and selectivity. We make use of a high finesse optical cavity to enhance the path-length and hence the sensitivity of detection. We used a multi-mode diode laser to excite multi-modes of the cavity which significantly reduces the sensitivity to vibration so that the sensor can be employed for field based applications.

**Name:** Joanna Tycner

**Title:** *Production of High Quality Holograms*

**Faculty Advisor(s):** Dr. Gottipaty Rao

**Abstract:** Holography enables us to record and display three-dimensional images of objects, unlike the two-dimensional images produced in photography. Holography has numerous applications in the preparation of holographic optical elements that are used in a myriad of optical devices, digital memory systems, etc.

Light is scattered by an object creating an object wave that holds a complete portfolio of information about the object. This includes shape, depth perspective, color, etc. The object wave has two important components, amplitude, which holds information about the intensity of the scattered light, and the phase information, which holds details about the shape and depth perspective. Essentially, the phase of the object wave contains all the information about the three-dimensional features of the object. In photography we have the capability to record only the intensity of the wave, but we lose the phase information. As a result, we observe only the two-dimensional projection of the object.

In holography, in order to record both the phase and intensity of the object wave, we use a

Helium-Neon laser as a coherent light source. We then record the interference pattern of the object wave and the reference wave on a high-resolution recording medium. When this high-resolution grating diffracts ordinary light, the object wave is reconstructed, creating a three-dimensional view of the object.

The experiment uses very high-resolution holographic plates, (6,000 lines per mm resolution) to record the interference pattern. We prepared a variety of excellent quality optical holograms such as transmission holograms that can be viewed by the laser source that was employed for its preparation. In addition, we were able to produce several reflection holograms, which gave a three-dimensional colorful view of the object. Experimental details related to the preparation of holos will be presented and several of the holograms prepared will be displayed at the Adelphi Research Conference.

**Name:** Koon Fai Wong

**Title:** *Understanding the Pechmann condensation reaction mechanism for the synthesis of 7-hydroxy-4-methylcoumarin and 7-hydroxy-4-difluoromethylcoumarin*

**Faculty Advisor(s):** Dr. Melissa Van-Alstine Parris

**Abstract:** Coumarin derivatives have wide applications in the pharmaceutical, cosmetic and color industries. The Hans von Pechmann condensation reaction is a simple one-pot method for synthesizing coumarins using resorcinol and  $\beta$ -keto esters as the starting materials. Previous studies on the synthesis of 7-hydroxy-4-trifluoromethylcoumarin (HFC) have established the mechanism for this compound as two key intermediates were successfully isolated. However, it was hypothesized that a change in electron affinity of the substituent in the 4 position may cause a different reaction path to be favored. The main objective of this research was to investigate the reaction path of the formation of 7-hydroxy-4-methylcoumarin (HMC) and 7-hydroxy-4-difluoromethylcoumarin (HDFC). No intermediates were isolated during the formation of HMC, however, an unexpected dimer-like compound was identified. It was found to be formed when one molecule of the  $\beta$ -keto ester reacts with two molecules of resorcinol. When monitoring the reaction, the dimer appeared to be an intermediate as its NMR peaks decreased over time while that of the product increased. Computational studies showed that the two key intermediates were unstable and had high energy levels in their respective Gibbs free energy profiles which helped explain why they could not be observed. In the formation of HDFC, intermediate 2 was successfully isolated by column chromatography and identified by  $^1\text{H}$  and  $2\text{D}$  NMR. However, the appearance of the dimer-like compound was observed again. Intermediate 1 of HDFC has been observed by NMR but it has yet been isolated. Further work has to be done to isolate these intermediates and to understand how the dimer is formed.

**Name:** Donald Wunder

**Title:** *Studying the Porosity of Polyindole*

**Faculty Advisor(s):** Dr. Justyna Widera

**Abstract:** Narrow band-gap semiconductors are highly susceptible to photocorrosion when they are applied in wet photocells. The polymers are used to coat semiconductors to stabilize their photoresponses and greatly increase photocurrent as seen in previous studies. Surface analysis of the polymer is crucial in optimization of the photocell architecture. In this project the porosity of polyindole (PIN) film was studied. PIN was obtained by the electrochemical polymerization of indole using cyclic voltammetry from a solution of  $10^{-2}$  M of indole in 0.1 M  $\text{LiClO}_4$  in acetonitrile on Pt and ITO. The polymerization potential range was set from 0 V to 1.2 V vs. Ag/AgCl reference electrode. A series of PIN films were obtained of the increasing thickness in 1 to 20 cycles.

The electrochemical probe, Tetracyanoquinodimethane (TCNQ) was used to determine the porosity of the PIN film. There are two redox potentials of TCNQ at: +0.20 V and -0.35 V vs. Ag/AgCl. Since PIN is not conductive in the potential range of the second redox peak of TCNQ, the presence of the TCNQ peak at -0.35V comes only from the redox response of TCNQ on the bare Pt electrode surface suggesting that the deposited PIN film is porous. Absence of the second TCNQ redox peak suggests that the entire Pt electrode surface is covered by the nonporous polymer film.

Atomic Force Microscopy (AFM) was used to take contact and non-contact mode images of the PIN films to provide the additional evidence of the polymer film porosity and to get an idea of the sample's surface topography. The electrochemical and microscopic studies confirmed that electrode substrate is fully covered in polyindole film after 12 cycles of polymerization.

#### **Section B: 9:40-10:40**

#### **Session 10: UC 213, 214**

#### **Physical Sciences and Mathematics II - Oral Presentations**

#### **Undergraduate Division**

**Name:** Eammon Hart

**Title:** *Excluded Minors of Families of Graphs*

**Faculty Advisor(s):** Dr. Branden Stone

**Abstract:** In mathematics, a graph is any picture made of points or vertices and edges that connect those vertices. A quick application of this object to view a network (servers/internet) as a graph. The purpose of this talk is to look at what types of finite collections of graphs can have excluded minors and explore the various patterns in these sets. The collections of graphs that we will look at will have different defining characteristics, like being planar, or the vertices having a maximum degree (number of edges attached to it), or trees (graphs with no cycles) and forests (graphs composed of trees.)

**Name:** Tracy Paltoo, Brian Kaufmann, & Tanner Grogan

**Title:** *Controlled, Pulsed Frequency Chirped Laser Light at Large Detuning*

**Faculty Advisor(s):** Professor Matthew Wright

**Abstract:** We have developed a technique to create pulsed, frequency chirped laser light (1 GHz in 5 ns) at large detuning ( $> 7$  GHz). Laser light is passed through an electro-optical phase modulator, where the light is modulated with a 7 GHz carrier signal whose frequency is modulated on the nanosecond time scale. The modulated light is passed into a diode laser, which becomes injection locked. The injection-locked laser system amplifies and filters the laser light to create a single frequency chirped laser pulse whose detuning is some multiple of the carrier frequency. We have developed the ability to pulse the laser on timescales less than 3 ns and create an arbitrary frequency chirp shape.

**Name:** Patrick Phelps

**Title:** *Matroids on Rings*

**Faculty Advisor(s):** Dr. Branden Stone

**Abstract:** Matroids are a well-researched topic of graph theory as they let us abstract the ideas of independence found in linear algebra. In 2014, Jeremy LeCrone and Nancy Ann Neudauer showed that a matroid can be formed over an Algebraic Group, using the notion of additive inverses to form independent sets. In this talk we will develop a definition that not only incorporates additive, but also



multiplicative independence. We will look at some attributes of this matroid including: basis, circuits, duals, co-circuits, and other known characterizations of a matroid.

**Name:** Yuhao Qiao

**Title:** *Ultra-sensitive, real-time trace gas detection using a high-power, multi-mode diode laser and cavity ring-down spectroscopy*

**Faculty Advisor(s):** Dr. Gottipaty N Rao and Dr. Andreas Karpf

**Abstract:** The measurement of trace concentrations of gases in the atmosphere has a wide variety of applications including environmental monitoring, defense and homeland security, and medical diagnostics. A measurement technique of particular interest is cavity ring-down spectroscopy (CRDS) since it is capable of measuring trace concentrations of gases in an absolute scale and does not need secondary calibration standards

We present a simplified CRDS trace gas detection technique that is insensitive to vibration, and capable of extremely sensitive, real-time absorption measurements. A high power, multi-mode Fabry-Perot (FP) diode laser with a broad wavelength range ( $\Delta\lambda_{\text{laser}} \sim 0.6 \text{ nm}$ ) is used to excite a large number of cavity modes, thereby reducing the detector's susceptibility to vibration and making it well suited for field deployment. When detecting molecular species with broad absorption features ( $\Delta\lambda_{\text{absorption}} > \Delta\lambda_{\text{laser}}$ ), the laser's broad linewidth removes the need for precision wavelength stabilization. The laser's power and broad linewidth allow the use of on-axis cavity alignment, improving the signal-noise-ratio while maintaining its vibration insensitivity. The use of a FP diode laser has the added advantage of being inexpensive, compact and insensitive to vibration. The technique was demonstrated using a 1.1 Watt ( $\lambda = 400 \text{ nm}$ ) diode laser to measure low concentrations of nitrogen dioxide ( $\text{NO}_2$ ) in zero air. A sensitivity of 38 parts-per-trillion (ppt) was achieved using an integration time of 128 ms; for single-shot detection, 530 ppt sensitivity was demonstrated with a measurement time of 60  $\mu\text{s}$  which opens the door to sensitive measurements with extremely high temporal resolution; to the best of our knowledge, these are the highest speed measurements of  $\text{NO}_2$  concentration using CRDS. The apparatus' reduced susceptibility to vibration was demonstrated by introducing small vibrations into the apparatus. No measurable effect on sensitivity was observed.

**Section C: 10:50-11:50**

**Session 19: UC 213, 214**

**Physical Sciences and Mathematics III - Oral Presentations**

**Undergraduate Division**

**Name:** Rayyan Alam

**Title:** *Identification of Drugs that Inhibit Trichomonas vaginalis Guanosine/Adenosine/Cytosine Nucleoside Ribohydrolase*

**Faculty Advisor(s):** Dr. Brian J. Stockman

**Abstract:** *Trichomonas vaginalis* is a parasite that causes one of the most prevalent sexually transmitted infections. Although the symptoms of trichomoniasis are typically mild, infected individuals are highly susceptible to cervical cancer, HIV and prostate cancer. *T. vaginalis* has developed increasing resistance to current drug therapies, with an estimated 5% of clinical cases resulting from resistant strains. Thus new methods of treatment are highly desired. *T. vaginalis* relies on nucleoside ribohydrolase enzymes to scavenge nucleosides from host cells to obtain the required nucleobases to carry out its own metabolic

processes. Uridine nucleoside ribohydrolase (UNH), adenosine/guanosine nucleoside ribohydrolase (AGNH) and guanosine/adenosine/cytosine nucleoside ribohydrolase (GACNH) have been identified as salvage pathway enzymes in the parasite. Since the three enzymes have different substrate specificities it is hypothesized that inhibitors of GACNH will be structurally distinct from inhibitors identified previously for UNH and AGNH. A robust <sup>1</sup>H NMR-based activity assay was developed and used to screen the National Institutes of Health Clinical Compound Collection. In order to increase screening throughput, compounds were screened in mixtures of three. Mixtures displaying inhibition were then deconvoluted. A total of 18 inhibitors were identified from the 573 compounds screened. The majority of these were obtained commercially and characterized further by determining IC<sub>50</sub> values in the presence and absence of detergent, and with increased substrate concentration. There was no overlap between inhibitors of GACNH and those of the pyrimidine-specific UNH. However, several adenosine analogs and flavonoids that inhibit AGNH were also found to inhibit GACNH. Interestingly, the guanosine analog ribavirin was identified as a strong, unique inhibitor of GACNH. Structure-activity relationships for related compounds are now being used to further define the GACNH pharmacophore.

**Name:** Phil Beylison & Ma Zhen

**Title:** *Design and Modeling of Spouted Bed Reactors*

**Faculty Advisor(s):** Professor John Doohar

**Abstract:** Spouting fluidized bed reactors have the potential of efficient energy conversion from coal and biomass. This program is a combination of experiment and theory designed to model the basic hydrodynamics of a spouted bed. This will allow an increase in the efficiency of spouted bed reactors for combustion, gasification, and chemical processing of coal and biomass. To model the hydrodynamics of the spouted beds, a simple system has been devised employing simple supplies. Using a blower, clear tubes and a high speed camera the approach used to assess the hydrodynamics of a spouted bed employs small diameter fluorescent particles. The bed particles will be entrained by the blower air. This will allow visualization of the flow and enable model development. This will allow designs that minimize the amount of fuel used for exothermic reactions in any high-temperature partial or total oxidation.

**Name:** Zachary Fallon, Megan Hoffman, Wesley Hodges, & Shane Bernard

**Title:** *Characterization of Arginine-Rich Binding in Protein-RNA Interactions*

**Faculty Advisor(s):** Professor Maria Nagan

**Abstract:** The Human T-Cell Leukemia Virus Type-1 (HTLV-1) is a complex retrovirus and causative agent of adult T-cell leukemia and tropic spastic paraparesis. The Rex protein in HTLV-1 is essential for the reproduction of new viral particles, acting post-transcriptionally and allowing for the formation of new virions. The Rex protein functions by binding to a region on the viral RNA called the Rex Response Element (RxRE), a critical point in its life cycle. A previous study characterized the NMR coordinates of a truncated 15-mer Rex peptide containing the arginine rich motif (ARM) bound to an RNA aptamer and identified three arginine residues that, when mutated to lysine, resulted in a thirty-fold loss in binding affinity between the Rex peptide and RNA aptamer (ARG5, -7, and -13). In this study, two 100ns MD simulations were ran for each mutant peptide complex, as well as two 100ns simulations of a triple mutant complex—giving two 100ns simulations for each of the four different systems. The mutated Rex peptides exhibit displacements from the RNA aptamer due to loss of water molecules at sites of high water density. The change in binding affinity due to the mutations is characterized by hydrogen bonding analysis, water density and lifetime analyses, and by monitoring displacement of the mutated peptide

along the RNA aptamer. Simulations were run using modifications of the Cornell et al. force field and TIP4P-Ew water; analyses and visualization were conducted using AmberTools and VMD.

**Name:** Sophia King

**Title:** *Electrochemical and Photoelectrochemical Investigations of Pt|PIn|CdS System*

**Faculty Advisor(s):** Dr. Justyna Widera, Dr. Magdalena Osial, Dr. Hab, and Dr. Krystyna Jackowska

**Abstract:** Phenolic compounds are known contaminants present in food, water and industrial wastes as well they are neurotransmitters that play a key role in “reward behavior” such as drug addiction and other neurological diseases. Quantitative detection of phenolic compounds at low detection limits would resolve many of the problems experienced in medical and environmental fields. Electrochemical methods can be potentially used for the detection of these compounds. Unfortunately, oxidation of these compounds leads to phenoxy radical reactions and cover the bare electrodes with a nonconductive film. Thus a novel method using platinum electrode modified with Polyindole (PIn)/Cadmium sulfide (CdS) hybrid was proposed. The electrochemical and photoelectrochemical studies were done for the bare Pt disc, Pt modified with CdS, Pt modified with PIn as well as the Pt|PIn|CdS hybrid to examine the role of each part of the hybrid and its influence on the redox reaction of catechol. It was found that the PIn catalyzed the redox reaction of catechol enhancing its detection, while CdS was responsible for the photoactivity of the hybrid. The Pt|PIn|CdS hybrid shows prospects as a photoelectrochemical catalyst, since the overall assembly did not compromise the ability of the individual parts of the hybrid to function effectively.

## PSYCHOLOGY

**Section A: 8:30-9:30**

**Session 3: UC 211, 211**

**Psychology I - Oral Presentations**

**Graduate Division**

**Name:** Mark Blanchard

**Title:** *Dependency and Relatedness*

**Faculty Advisor(s):** Dr. Robert Bornstein

**Abstract:** This study examined the relationship between interpersonal dependency and interpersonal relationships in the contexts of romantic, family, and peer relationships. Two-hundred twenty-five university students (183 women and 42 men) took part in the study. To evaluate levels of interpersonal dependency, participants were administered the Relationship Profile Test (RPT; Bornstein & Languirand, 2003); they also completed three widely used measures of relationship quality: the Perceived Relationship Quality Components Test (PRQC; REF), the Relationship Questionnaire (RQ; REF), and the Experiences in Close Relationships-Revised scale (ECR-R; REF). Scores on the PRCQ, RQ, and ECR-R were then compared to the RPT to discover any significant correlations. Results indicated that RPT scales and the attachment styles are strongly correlated. Secure attachment is linked with healthy dependency, detachment is linked with dismissive style, and anxious ambivalent attachment is linked with overdependence. It was also discovered that relationship quality (both total and also the components) are negatively related to unhealthy dependence and positively related to healthy dependency. Conceptual and empirical implications are discussed.

**Name:** Colleen Bucci

**Title:** *Developmental Precursors of Cognitive Abilities*

**Faculty Advisor(s):** Dr. Laura Brumariu

**Abstract:** Cognitive abilities are crucial for one's development. Many theories have identified various precursors of cognitive abilities. Few studies explored the relations of maternal depression, maternal stimulation of a child's environment, and child anxiety with children's cognitive abilities longitudinally; and, fewer investigated mechanisms explaining these relations. Based on past research, we hypothesized that 1) maternal depression, maternal stimulation, and child anxiety in infancy would predict children's cognitive abilities at age 15; 2) attachment security, classroom engagement, and academic self-efficacy in middle childhood would explain these relations; and 3) quality of teacher-child relationship (closeness and conflict) would explain the relation between maternal stimulation and a child's classroom engagement. This study relied on the longitudinal NICHD Study of Early Child Care dataset (N = 1,065). Mother's completed measures of depression, stimulation, and child anxiety (1 – 36 months.) Teachers rated their relationship with children (grades 2 - 4.) Children completed measures of self-efficacy, engagement, and attachment (grades 5 – 6,) and cognitive abilities (grade 8 and age 15). Structural equation modeling testing our hypotheses indicated good fit. Results showed that maternal stimulation and child anxiety are significantly associated with a child's later cognitive abilities. Maternal depression was not a predictor. Child engagement and self-efficacy explained the relations between maternal stimulation and child cognitive abilities. Finally, closeness and conflict mediated the relation between maternal stimulation and classroom engagement. Results show the importance of quality of early maternal stimulation and child anxiety for adolescents' cognitive abilities, in the context of other factors. Identifying mechanisms through which maternal stimulation influences cognitive abilities over 12 years of age is important for improving prevention efforts.

**Name:** Joseph Desinor

**Title:** *Psychological impact on children of mothers afflicted with depression and/or addiction.*

**Faculty Advisor(s):** Professor Denise Hien, Ph.D, A.B.P.P. and Associate Professor Carolyn M. Springer, Ph.D.

**Abstract:** This study focuses on further identifying the (1) the connection between maternal substance abuse/use disorders (SUDs) and poor parenting, and (2) poor parenting and outcomes placing children at risk for negative behavior. Literature shows connections between reported exposure of children to parental discipline, sexual/physical/emotional abuse, maltreatment, neglect, and history of parental SUDs. (Stevenson-Hinde, 1998; Epstein & Komorita, 1965; Gauthier et al, 1996; Maccoby, 2000; Magura & Laudet, 1996; Sheridan, 1995). This study will examine outcomes in adulthood resilience or succumbing to effects of childhood abuse. (Carver, 1989; Rutter, 1987; McCloskey et al, 1995; Widom, 1999). Method: This is a secondary analysis of a larger study on neurobehavioral outcomes in 187 inner-city mother/child dyads. Self-report and clinical assessments of maternal histories childhood abuse, mothers psychopathology including SUD and depression, measures of parenting styles, and adverse child-rearing outcomes, including behavioral aggression and conduct disorder were conducted. Groups will be classified as (1) mothers with histories of SUDs, whether also suffering depression, (2) mothers without SUDs, but with histories of depression, and (3) a comparison group of mothers without SUDs or depression. Data analyses will examine associations between parenting styles and adverse child outcomes, with the hypothesis that poor monitoring and abuse parenting will be associated with with/without SUDs and/or depression and will predict child outcomes in behavioral aggression and conduct disorders. Conclusion: Children may be more at risk for adverse outcomes as a result of

maternal substance use and poor/abusive parenting. The implications of study findings will shed light on what triggers children to be resilient adults, or internalize/externalize trauma and continue SUDs/abuse cycle. Implications for future research/intervention on behalf of children will be discussed.

**Section B: 9:40-10:40**

**Session 12: UC 313**

**Psychology II - Oral Presentation**

**Undergraduate Division**

**Name:** Sarah Beckerman

**Title:** *Perception of Humor Based on Gender: Does Gender Affect the Effectiveness of Humor?*

**Faculty Advisor(s):** Professor Joel Weinberger

**Abstract:** This study's goal is to assess whether males are more readily perceived as funny than females in the general populace. Participants are shown a two-panel comic strip in which a male or a female is telling the same joke. They are then asked whether the person was funny, whether the joke was funny, and some demographic questions. The study was dispersed online. The hypothesis is males will be seen as funnier by the sample, based on the Freudian theory that humor is based on aggression. Limitations for this study include the time frame and the lack of similar tests.

**Name:** Kathryn Graham

**Title:** *BPD-like Features and Cognitive Abilities in Adolescence: A Mediation Model*

**Faculty Advisor(s):** Dr. Laura E. Brumariu

**Abstract:** Borderline personality disorder (BPD) negatively impacts one's academic and social functioning (American Psychiatric Association, 2012). Studies have shown that adolescents with BPD features might have lower cognitive abilities such as working memory deficits (Bagge et al., 2004). The literature, however, lacks a clear understanding of the mechanisms explaining relations of BPD-like features and cognitive abilities in adolescence.

Based on theory and previous literature (Creed & Klisch, 2005; Seginer, 2000), we evaluated whether psychosocial maturity and future planning explain the relation between BPD-like features and cognitive abilities in adolescence.

This study relied on the large dataset of the NICHD Study of Early Child Care and Youth Development (n=891, age=15 years). BPD-like features were assessed using measures indexing BPD symptoms (Lyons-Ruth et al., 2013). Adolescents completed questionnaires assessing future planning and psychosocial maturity (3 subscales: identity, work orientation, and self-reliance). Cognitive abilities were assessed using the Woodcock-Johnson Intelligence Test.

The results show that adolescents with more BPD-like features presented lower levels of cognitive abilities ( $r = -.14, p < 0.01$ ), future planning ( $r = -.22, p < 0.01$ ), and psychosocial maturity ( $r = -.42, p < 0.01$ ). Additionally, adolescents with higher levels of future planning and psychosocial maturity showed higher levels of cognitive abilities (Future Planning  $r = .13$ , Psychosocial Maturity  $r = .16, p < 0.01$ ). Psychosocial maturity, but not future planning mediated the relations between BPD and cognitive abilities [CI (-2.184, -.237)].

This study is among the first to identify specific mechanisms explaining the relations between BPD and cognitive abilities in adolescence. Findings suggest that interventions for adolescents experiencing BPD-like features targeting their psychosocial maturity may also assist in enhancing their cognitive abilities.

**Section B: 9:40-10:40**

**Session 13: UC 211-212**

**Psychology III - Oral Presentation**

**Graduate Division**

**Name:** Justina Dillon

**Title:** *The Legacy of Trauma in Post-Soviet Lithuania: Survival, Adaptation, and Remnants in the Life Narrative of a 1941 Deportee*

**Faculty Advisor(s):** Professor Michael O'Loughlin

**Abstract:** Under the Soviet occupation of Lithuania in the 1940s and 1950s, 132,000 non-prisoner Lithuanians, 70% of them women and children, were forcibly deported to Siberia, the Arctic Circle, and Central Asia as a consequence of political upheaval and as a tool of oppression. In presenting this paper, I will explore the process of trauma narrativization revealed through an extended interview with a Lithuanian woman survivor of the 1941 deportation. The manifestations of unspeakable suffering expressed in her life narrative will be evaluated in light of the psychoanalytic literature, with a particular focus on potential mechanisms for the intergenerational transmission of trauma. As cross-border displacement continues to be a prevalent issue in today's world, the insights from this study might help inform our understanding of resiliency as well as long-term social and psychological impacts of such circumstances.

**Name:** Rachel Hartmann

**Title:** *Traumatic Events and Quality of Life among Individuals with Military Experience: A Secondary Analysis*

**Faculty Advisor(s):** Dr. Carolyn M. Springer

**Abstract:** Post-traumatic stress disorder (PTSD) in our military is highly underreported and lacks significant research. Occurrences have increased substantially post 9/11 affecting an average of 20% of veterans in a given year (U.S. Department of Veterans Affairs, 2015). In 2009, 16,959 incidents of PTSD and 309 suicides were recorded reaching its highest prevalence in 2012 with 21,017 individuals affected, 525 suicides reported (Congressional Research Service, 2015; Department of Defense, 2010, 2015). Data supports this rapid influx of symptomatology is proving to be a concerning and persistent epidemic. This research examines the variations in our servicemen's overall quality of life (QOL) when correlating traumatic events and possible PTSD. Specific personal views, experiences, and symptoms may be interrelated and potential associations could allow for early detection. A secondary data analysis was conducted using a national sample collected by the Pew Research Center in 2011. Telephone and online interviews surveyed 1,853 U.S. military veterans (Mean age= 59.31, 159 females) no longer on active duty. A QOL and PTSD index was created by extracting items from the survey that were synonymous with items in the World Health Organization's Quality of Life Scale-BREF (WHOQOL-BREF) and the PTSD Checklist-Military Version (PCL-M). Correlations between both indexes and itemized survey responses detailing subjective experiences of traumatic and non-traumatic events found significant results. Veterans who reported negative military experiences and a more difficult adjustment to civilian life after deployment also reported more PTSD symptoms.

**Name:** Ayako Nakashita

**Title:** *Cultural influence on dependency in personality: Comparison between Japan and the U.S.*

**Faculty Advisor(s):** Dr. Robert Bornstein

**Abstract:** The relationship between culture and personality is close in that humans understand what

characteristics are respected and expected in their culture and grow up to be who they are supposed to be in that particular society (Higgins, 2008). Therefore personality disorders are susceptible to cultural influence.

In order to study the influence of cultural differences in personality between Japan and the U.S., I explored dependent tendencies in the two cultures. Doi (1992) noted that “amae” (or relationship dependency) plays an important role in Japanese communication. Furthermore, since the meaning of dependency differs in Japan and the U.S., it is difficult to draw a single line which sets the pathological threshold of dependency, because it is largely affected by the culture that the patients are in (Chen, 2009). This fact brought me to examine Dependent Personality Disorder (DPD) specifically. Contrasted to the individualism of the west, collectivism in Japan reflects their emphasis on dependent relationships, necessity of adjustment to others, implicit prohibition against self-assertion, and non-verbal communication for the purpose of uniformity.

Based on the contrast in definition of dependency in both countries, it was concluded that Japanese people have a high tendency of dependency in general, and therefore need more severe intensity of dependency to be diagnosed as DPD. Moreover, dependency in Japan has a significant role in Japanese culture in the way that the ultimate goal of dependency is harmony (Rothbaum, 2000). Specifically, dependency in Japan works as a healthy defensive mechanism, and is therefore more accepted than unhealthy dependency in the U.S.

**Name:** Vanja Radoncic

**Title:** *Stress Reactivity in the Context of Trauma Exposure and Marijuana Use*

**Faculty Advisor(s):** Dr. Denise Hien

**Abstract:** Trauma exposure is associated with increased drug abuse. A mechanism linking trauma and substance abuse is dysregulation of acute stress responding. Little is known how an interaction between trauma exposure and stress reactivity impacts the factors that influence marijuana use. This line of research is needed because of the growing public health debate around marijuana use and disparities in its use and consequences among racial ethnic groups. Aims: This research project aimed to compare responses to an acute social stressor such as the Trier Social Stress Test (TSST) in marijuana (MJ) users with and without past trauma exposure, hypothesizing that a group with more trauma exposure (high post-traumatic stress; PTS) would have more dysregulated stress responding compared to the group with less trauma exposure (low PTS), and those with no trauma exposure (NT). Methods: Non-treatment-seeking daily MJ smokers (102 Males, 23 Females) with no current Axis 1 diagnoses (except MJ abuse or dependence) completed the Trauma Assessment for Adults (TAA) and TSST. Stress response was assessed with heart rate, salivary cortisol, and subjective anxiety (STAI; POMS). Participants also reported baseline depressive symptoms (BDI), emotion dysregulation (DERS) and impulsivity (BIS). Participants were divided into three groups: high PTS group reporting  $\geq 3$  trauma (N = 35), low PTS group reporting  $\geq 1$  and  $< 3$  trauma (N = 57), and those with no trauma exposure (N = 33). Results: High PTS group had been exposed to 3.1 (SD = 1.1) types of trauma. High PTS group had most elevated anxiety levels throughout the TSST (measured with STAI and POMS) and increased heart rate compared to low PTS and NT groups, with significant differences in cortisol levels. Conclusions: These initial data indicate that higher levels of trauma exposure were associated with greater dysregulation of stress responses, which implies that MJ smokers with trauma-exposure are more sensitive to MJ use and relapse.

**Section C: 10:50-11:50**

**Session 15: UC 201**

**Psychology IV - ePoster Presentation**

## Graduate Division

**Name:** Shimaa Alagha

**Title:** *Impact of Early Childhood Attachment on Parenting Beliefs and Behavior Among Saudi Arabian Parents*

**Faculty Advisor(s):** Dr. Carolyn Springer

**Abstract:** The purpose of the study was to assess the link between adult attachment style and parents' emotions and cognitions. Recent attachment research has examined the impact of early childhood relationships on adult attachment. This study examined how a parent's relationship with their own parents impacts their relationship with their own children. Parents (N=125) completed self-report measures of The Relationship Structures questionnaire (ECR-RS), Attitudes Toward Parenthood Scales, The Parental Stress Scale, The Child-Parent Relationship Scale, and Emotions-Related Parenting Style. The results are discussed within the framework of attachment theory. Future studies are needed to determine the fundamental associations between Saudi adult attachment style and parenting.

**Name:** Heather Archer

**Title:** *Alcohol risk behaviors among high school students*

**Faculty Advisor(s):** Dr. Carolyn Springer

**Abstract:** This study will investigate gender and regional differences in the use of substances, particularly alcohol and types of factors associated with use. It will explore the possibility of including secondary research by using existing national databases like the Youth Risk Behavior Surveillance Data, which is collected by the Center for Disease Control. This data is collected every two years from ninth to twelfth grades and focuses on health risk behaviors including substance abuse. In addition, this study will show how substance use impacts academics, and social and family relationships of high school students.

**Name:** Gina Avignone

**Title:** *A qualitative inquiry into understanding homelessness and the thresholds of difficulties homeless men face*

**Faculty Advisor(s):** Dr. Michael O'Loughlin and Dr. Jairo Fuertes

**Abstract:** This study uses qualitative, semi-structured interviews to examine the subjective experiences of men who are currently homeless. The purpose of this current study is to explore these issues in greater depth with one on one interviews with homeless persons to gain insight on the different thresholds of difficulties these men face. Five diverse, homeless men from Long Island ranging in age from 19-38 were interviewed. All of the men were current residents at the The Center located in Long Island, New York. The respondents were asked about their life history, their support systems, their experiences being homeless, and the services they found to be helpful or unhelpful. The goal is to obtain a better understanding of the experience of homelessness and also how traumatic comorbid factors influence homelessness. Protective factors and risk factors right from the beginning of life will be identified and explored. Through this examination, I hope to demonstrate the consequence of adverse behaviors and co-morbid affects as contributing factors to homelessness, such as familial structure, drug and/or alcohol use, psychiatric issues, and presence or absence of community. Through acquiring insight into the experience of homelessness, and an understanding of comorbid factors, I hope to aid in finding new ways to relieve or prevent homelessness in the future.



**Name:** Chelsea Breimann

**Title:** *Online Dating and Authenticity*

**Faculty Advisor(s):** Dr. Lawrence Josephs

**Abstract:** Opposites attract has been a common statement amongst individuals when describing the likelihood of dating someone, however recent studies have shown the opposite. Assortative mating theory explains that those who are similar to one another are more likely to be attracted to each other. Considering the rise of modern technology, online dating, has increasingly become a popular way to interact and meet potential mates. The present study examined online dating as it relates to authenticity; an individual's willingness to be honest and open in their relationship. Participants were presented with an online survey consisting of personality assessments (AIRS, Dirty Dozen, ASI, AMI), a vignette of an online dating profile, likelihood questionnaire of dating the proposed individual, and demographic information. We examined the relationship between the individual's personality characteristics (narcissism, and authenticity) and their choice on whether or not they would date the individual presented to them (narcissistic or authentic). We hypothesized that those who scored higher in narcissism (dirty dozen scale) would additionally score higher in sexism (AMI and ASI) and prefer to date the individual portraying narcissistic traits in their profile (inauthentic). Secondly we hypothesized that those who scored higher in authenticity (AIRS) would score lower in sexism, and prefer to date the individual portraying authentic traits in their profile (authentic). Limitations and implications for the future of online dating are discussed.

**Name:** Andrew Fox

**Title:** *Association of Five Factor Personality Traits with Response to a Positive Mood Induction*

**Faculty Advisor(s):** Professor Michael Moore

**Abstract:** The majority of past research on mood stimulation has been directed towards negative mood induction (e.g., Krahe & Bieneck, 2012; Richell & Anderson, 2004; Scherer, 2004). While researchers have discovered that certain personality traits may influence levels of mood when listening to happy or sad music (i.e., extraverts generally prefer happy music), there are no known studies using music as a positive mood induction (Chamorro-Premuzic & Furnham, 2010). The purpose of this investigation is two-fold: 1) To determine if a musical stimulus can successfully generate a positive mood induction and 2) To identify particular personality traits that may correlate with such a positive mood experience. The musical stimulus utilized is Mozart's Sonata for Two Pianos in D, a classical piece that has been incorporated in a previous work using music as an acute treatment for depression (Castillo-Perez, et al., 2010). This study employs the Big Five personality traits (Neuroticism, Extraversion, Openness to Experience, Conscientiousness, and Agreeableness) as a model, which are thought to comprehensively account for the personality structure of most people (Chamorro-Premuzic, 2007; Matthews, Deary, & Whiteman, 2003). Participants of this online survey were recruited from social media websites (Facebook and Twitter), as well as Adelphi University undergraduate students. Participants were asked to complete a measure of the Big Five (the NEO-FFI; McCrae & Costa, 2004) and a measure of positive and negative mood (the PANAS; Watson, Clark, & Tellegen, 1988). They were then asked to listen to a piece of music designed to induce a positive mood, followed by a subsequent administration of the PANAS. Data collection for this study is ongoing.

**Name:** Dennis Higgins

**Title:** *Social Support and Adjustment to College Among Traditional, Non-Traditional, and Veteran Students*

**Faculty Advisor(s):** Dr. Katherine L. Fiori

**Abstract:** This study examines how the size and nature of social support networks is differentially associated with adjustment to college and mental health among college student veterans and non-veterans. University undergraduates (N=54) were administered an online survey measuring the size and quality of social networks—both overall and specifically for family, friends before college, and college friends; perceived social support on three scales: family, friends, and significant other; symptoms of depression, anxiety, and stress; and how well the student has adjusted to college across a number of domains. Means were compared between veterans and non-veterans using independent-samples t-tests and, due to small sample size, student status was examined as a moderator of the associations between social support and college adjustment/mental health by running separate regressions for veterans and non-veterans. Veterans reported less robust overall social network size and quality, likely due to less robust networks of college friends and friends prior to college. We found a positive association between overall social network and adjustment to college across several domains among both student statuses, in particular for academic and social adjustment. The size and quality of the social network was differentially associated with depression, anxiety, and stress depending on student status (veteran vs. non-veteran) and social network size. Among veterans, there were no significant associations between social networks and depression, anxiety, and stress, although there was an association between the family network and these domains for non-veterans. There were significant associations between perceived support and both adjustment and depression in the veteran sample, but not in the non-veteran sample. These findings illustrate that social support, particularly from family, appears important in the ability for a college student to adjust to college.

**Name:** Kim Keller

**Title:** *Initiating New Relationships: Self-Esteem and Bias*

**Faculty Advisor(s):** Professor M. Joy McClure

**Abstract:** This study examined the relationships between self-esteem, rejection threat, and directness of dating behavior. We will further explore participants' perceptual biases about how clearly their approach communicates romantic interest to a potential partner. 100 participants over the age of 18 completed a web survey. Participants reported their self esteem, then they were randomly assigned a to read a high threat (greater potential for rejection), low threat (greater potential for success), or neutral threat relationship initiation scenario. Participants were asked how likely they were to use direct (e.g. asking the person out, flirting) and indirect (e.g. just trying to be around them, smiling) behaviors in their given scenario. Participants then rated how clear or subtle they perceived those same behaviors to be. We predict that individuals with low self-esteem will prefer more indirect behaviors but will perceive those behaviors to be more direct than will people high in self-esteem. Further, we expect that will be exacerbated in the scenario that poses a greater threat for rejection.

**Name:** Angie A. Morssal

**Title:** *Parent-Child Attachment and Emotion Regulation in Saudi Arabian Children*

**Faculty Advisor(s):** Dr. Laura E. Brumariu

**Abstract:** Attachment theory postulates that children's relationships with attachment figures influence their emotional development (Bowlby, 1982). Previous literature suggests that securely attached children are better at regulating their emotions than insecurely attached children (Sroufe & Waters, 1977; Brumariu, 2015). However, attachment has been studied less in middle childhood compared to other developmental periods (Kerns, 2008), and little is known about quality of attachment in Middle

Eastern countries. The goal of this study was to enhance our understanding of how attachment relates to children's emotion regulation abilities in Saudi Arabia, a country with a familial constellation that is different than that of western cultures, mainly in family's reliance on extended families when rearing children. Based on previous research, we hypothesize that more securely attached children will be better able to regulate their emotions, specifically by exhibiting better coping strategies, better abilities to express their emotions, and lower inhibition and dysregulation than insecurely attached children. The sample included 90 Saudi Arabian children ages 6.5 to 12.5. Mother- and father-child attachment security was measured using the Attachment Security Scale (Kerns, Aspelmeier, Gentzler, & Grabill, 2001). Children also completed questionnaires assessing emotion regulation abilities (i.e., inhibition, coping, dysregulation and expression), such as the Emotion Expression Scale for Children (Penza-Clyve & Zeman, 2014). Results indicated that children with greater security with fathers expressed better coping and emotion expression, and lower dysregulation. Attachment security to mothers was only significantly related to emotion expression. In sum, parent-child attachment is related to various aspects of emotion regulation in Saudi Arabian children. These findings particularly underscore the importance of father-child attachment for emotion regulation abilities in middle childhood.

**Name:** Christine Raco

**Title:** *Attachment Styles Effects on Risky Sexual Behavior and Likelihood to Apply Lesson Learned in Sexual Education*

**Faculty Advisor(s):** Dr. Lawrence Josephs

**Abstract:** There are many factors that contribute to an individual in engaging in risky sexual activities. One predominant factor found in research is the type of attachment style the individual has in intimate relationships. It has been proven by research that an individual that is anxiously attached, or has an avoidant attachment is more likely to engage in risky sexual behaviors. Research has found that self-esteem developed through an individual's attachment, with either their caregiver or romantic partner, also plays a role in the promiscuity of an individual. Individuals who are high on narcissism tend to be more likely to engage in risky sexual behavior, compared to those who are low on narcissism. Research has found this due to the perception that individuals who score high on narcissism, are perceived as having a low self-esteem. One's previous sexual education, and attitude towards the effectiveness of the education can be used as a determinant for the likelihood of the individual engaging in risky sexual behavior. There has been a lot of research into different personal variables that can influence an individual's propensity to engage in risky sexual behavior, such as an individual's attachment style, level of narcissism, previous sexual education history, and the individual's perception towards the effectiveness of their sexual education. What remains unknown in research is how these variables interact with sex education. The aim of the research conducted in this study, was to determine how individual's attachment, sexual education, perceived effectiveness of the sexual education, ranking on the narcissism scale, and gender factor in to one's propensity to engage in risky sexual behaviors. The study also aimed at determining how these variables interact with sex education.

**Name:** Emel Taskakan

**Title:** *Gender differences in trustworthiness bias in trauma-exposed individuals compared to controls*

**Faculty Advisor(s):** Professor Denise Hien

**Abstract:** Research indicates that interpersonal trauma exposure can also impact perception of trustworthiness of others. Trustworthiness bias may present a vulnerability factor in women in particular. The current study is seeking to extend previous findings regarding differences in

trustworthiness with respect to gender and reported trauma by using interpersonal data from a psychophysiological experimental study which will examine facial perceptions of trustworthiness within a subclinical population of university students. The aim of the study is to see if the gender of the perpetrator causes biased untrustworthiness to a male face among the participants. It is hypothesized that results will yield statistically significant differences between trustworthiness of participants who were traumatized by a man versus a woman. However, female participants are hypothesized to be presenting with significantly more indiscriminate untrustworthiness when compared to their male counterparts. Sixteen participants will be divided into groups based on the gender of the perpetrator and participant to compare the level of rated trustworthiness to a male face in a controlled lab setting. Participants will rate the level of trustworthiness of faces that were parametrically morphed along a trustworthiness dimension using fear-trust task which has been shown to be predictive of sensitivity and discriminability of trust among participants. Data will be analyzed using bivariate and multivariate analyses of variance with gender and trauma exposure as the independent variables and rated untrustworthiness as the dependent variable. Implications for research and applied work in the area are summarized.

**Name:** Tanisha Willis

**Title:** *Does difficulty breaking up mean difficulty letting go?*

**Faculty Advisor(s):** Professor Joy McClure

**Abstract:** The present research investigated how distress after romantic relationship break-up affects our perception of future relationships. In particular, we examined whether experiencing more distress after a breakup leads people to expect less social reward (e.g. fun, intimacy) and more social threat (e.g. misunderstandings, hurt feelings) in future relationships. We are also interested in examining whether individual differences in attachment security--that is, the expectation that close others are reliable sources of caring and support--protects against the impact of distress on future relationships. Participants will include one hundred people who have experienced the break-up of a significant romantic relationship (described as a relationship "that has lasted for some time or in which they were seriously emotionally involved") within the last year. Participants will complete a websurvey measuring self-reported attachment, break-up distress, and perceptions of social reward and threat in future relationships. We expect that more break-up distress will predict decreased social reward and increased social threat perceptions of future relationships. Further, we expect that the association between distress and future relationship perceptions will be weaker for people who are higher in security.

### **Undergraduate Division**

**Name:** Nathalia Aguilera

**Title:** *Parental Well-being in Parents of Children Diagnosed with Autism Spectrum Disorder*

**Faculty Advisor(s):** Dr. Laura Brumariu

**Abstract:** It is well established that parents of children with autism spectrum disorder (ASD) experience lower levels of overall well-being (Baker et al., 2002). Further, receiving, processing, and adjusting to a diagnosis of ASD is generally difficult and overwhelming for parents (Wachtel & Carter, 2008). The literature, however, lacks a clear understanding of which parental factors might contribute to acceptance/denial or resolution of the child diagnosis and why. The first goal of this study is to evaluate whether parents that are experiencing lower levels of well-being, including stress, anxiety, and depressive symptoms, have more difficulties accepting the child's diagnosis. The second goal is to evaluate whether parental empathy toward the child is one factor explaining or mediating these

relations. Participants in this study are mothers and fathers of children with ASD, recruited from two treatment agencies. IRB approval was obtained and data collection is in progress. Parents complete self-report measures of well-being (stress, overall life satisfaction, and depressive symptoms), empathy toward the child, and resolution of the child's diagnosis. Children's diagnoses are obtained through parental reports corroborated by the psychological assessments completed at the treatment agencies. Overall, the results of this study are highly relevant for professionals who work closely with parents of children with ASD. Identifying potential factors that contribute to the parents' understanding of the children's diagnosis is particularly important for children's treatment, and mental health professionals might be able to utilize our findings to communicate with parents more efficiently.

**Name:** Larina A Arcese, Krista Bevilaqua, Mary Demaio, Stephanie Ganor, Nichole T Garcia, Danielle K Gergoric, Celeste Craziose, Ashley Hernandez, Victoria Hrzich, Gabriella Irace, Michael Jacobs, Bianca Lastra, Bryan Johnson, Angelo Luongo, & Ayaralisy M.

**Title:** *Under Investigation: Student Projects from Practicum in Experimental Psychology*

**Faculty Advisor(s):** Dr. Carolyn M. Springer

**Abstract:** Practicum in Experimental Psychology, an interactive capstone experience for undergraduate psychology majors, builds upon students' knowledge of research methodology and statistics and provides them with a venue for independently designing and conducting their own research study. This poster presents the on-going research projects of students enrolled in Section 004 of this class in Spring 2016. Students will discuss their progress to date in devising, implementing and analyzing data from their research studies which span a variety of areas in the field including developmental psychology, social psychology, sports psychology, educational psychology, personality, health psychology, and cognitive psychology.

**Name:** Felicia Azeez

**Title:** *Growth Mindset and Children of Color in an Underperforming School*

**Faculty Advisor(s):** Dr. Jennifer Durham

**Abstract:** Carol Dweck provides decades of research on achievement and success, including the development of the construct of mindsets. In a fixed mindset, individuals believe basic qualities, like their intelligence or talents, are unchangeable traits. In a growth mindset, individuals believe that their most basic abilities can be developed through dedication and hard work. With this belief, a love of learning and resilience can flourish and lead to greater accomplishments. A considerable amount of research confirms that increases in African American student achievement can arise from dramatic changes in student-teacher interactions. Researchers (Cohen, Garcia, Apfel, & Master) explain that a student's awareness of a negative group stereotype can impact their performance and learning by creating a sense of psychological threat. With the correct intervention, this level of psychological threat experienced in the classroom setting can be reduced, and thus leading to improved grades and performance. Using a correlational design, the present study explores the mindsets of sixth grade students at a middle school designated as "underperforming", by the state of New Jersey. After the administration of a questionnaire that contains indicators of both growth and fixed mindsets, students participated in a workshop where evidence based techniques to cultivate a growth mindset were presented. At the conclusion of the workshop a post questionnaire was administered. Responses were analyzed for prevalence consistency, and relationships between growth and fixed mindset questions. This study examines the relationship between responses to growth questions and responses to the fixed mindset questions before and after the intervention.

**Name:** Margaret Byrnes

**Title:** *The Role of Commuting Status: Does Social Support Predict Health Outcomes Differentially across the Transition to College?*

**Faculty Advisor(s):** Dr. Katherine Fiori

**Abstract:** The availability of social support (i.e., social provisions) has been found to promote physical and psychological health, both in general and across important life transitions. The transition to college is unique in that the social context changes drastically for some (residential students), but less dramatically for others (commuter students). Little is known about how initial levels of social support may differentially affect the well-being of these students across the transition to college. The current study sought to fill this gap by exploring the association between self-reported social provisions at the start of college with health problems and depressive symptoms at the end of the first year, and how this association might differ for commuter versus residential students. The sample included 111 students from whom we had full data at both time points (34.5% residential). We conducted a series of hierarchical linear regressions, first for the overall sample, then separately for commuter and residential students. We regressed self-reported health problems at Time 2 on Time 1 social provisions, controlling for Time 1 health problems, and we regressed depressive symptoms at Time 2 on Time 1 social provisions, controlling for Time 1 depressive symptoms. These analyses showed that social provisions at Time 1 significantly negatively predicted health problems and depressive symptoms at Time 2, but only for those students living on campus. Our results have implications for targeting interventions that utilize social support, and also indicate that individuals who reside on campus may value social relationships differently from those who remain living with their parents.

**Name:** Esther Libby Frankl

**Title:** *Personality, Parenting and Academic Attitudes*

**Faculty Advisor(s):** Professor Lawrence Josephs

**Abstract:** The purpose of this research project is to see if vulnerable narcissism is correlated with certain parenting practices and to see if that predicts certain academic attitudes and performances. This project also wishes to highlight the differences between vulnerable and grandiose narcissism with respect to parenting practices. Specifically we will be studying whether a vulnerable narcissist is more likely to have grown up with helicopter parenting style or over-evaluating parenting style or a lack thereof. Once we have highlighted the correlation between parenting and vulnerable narcissism, we will then look at academic attitudes in hope of uncovering whether vulnerable narcissists are different in their academic attitudes than grandiose narcissists are. Evidence has shown that though grandiose narcissists can have high levels of academic entitlement, their academic performances are not superior (Chowning, Campbell 2009). There has been little research investigating whether vulnerable narcissists prove to be different in their entitlement levels and overall academic performances.

**Name:** Gianna Glock

**Title:** *What Therapist Interventions Do Patients with Anxiety Problems Find Most Useful in Their Improvement During Psychotherapy?*

**Faculty Advisor(s):** Dr. Mark Hilsenroth and Dr. Rebecca Curtis

**Abstract:** Several studies have examined the effectiveness of different methods of psychotherapy in treating people with mental illness. However, relatively little has been done to determine what patients find most helpful with regard to their improvements during treatment. This research will explore what specific interventions people find most helpful regardless of the type of therapy they receive. It is

important for therapists to have a better understanding of how they can intervene in ways that will be most beneficial. This project focuses on patients seeking treatment for anxiety symptoms as their primary concern in therapy. Data was collected in an online survey from 34 participants (28 of which were still in therapy at the time of the survey and 6 who had ended treatment within 3 months prior). On average participants were in therapy for 26.6 months (SD = 20 months), and averaged 34.1 sessions (SD = 17.15). On a scale of 1 to 9 with 9 being the highest level of distress due to anxiety, the mean was 8.1 (SD = 1.4). Average overall helpfulness of therapy was 7.4 (SD = 2.1). Average overall improvement during the course of therapy at the time of the survey was 7.0 (SD = 1.9).

Patients rated the helpfulness of different therapist interventions during their treatment and these ratings were examined for a relationship to overall improvement. Significant findings included: exploring uncomfortable feelings ( $r=.443$ ,  $p=.009$ ); feelings & perceptions are linked to past experiences ( $r=.340$ ,  $p=.019$ ); focus primarily on current life situations ( $r=.428$ ,  $p=.012$ ); provide information on symptoms ( $r=.341$ ,  $p=.048$ ); practice behaviors between sessions ( $r=.345$ ,  $p=.046$ ); explore early memories ( $r=.472$ ,  $p=.005$ ). Trends toward significance between the rated helpfulness of the following therapist interventions with improvement in their therapy included: provide explicit advice or direct suggestion ( $r=.338$ ,  $p=.051$ ); explore alternative understanding of patient experiences ( $r=.320$ ,  $p=.065$ ).

**Name:** Barbara Ippolito, Danielle Waldron, Lauren Deptula, & Timothy McGowan

**Title:** *Gender Differences in Object Relations of Physically Abused Children*

**Faculty Advisor(s):** Dr. Francine Conway

**Abstract:** Physical abuse among children is a prevalent problem in the United States. Briere and John (2003) found that 22.2% of males and 19.5% of females experienced physical abuse at least once during childhood. Previous research has found that physically abused children, compared to non-abused children, express greater impairment in object relations (Freeddenfeld, Ornduff, & Kelsey 1995; Ornduff and Kelsey 1996; Reidy 1997). The gender differences in incidences of physical abuse is clear, but whether gender differences are also evident in the object relations of abused children is unclear. The present study examined the object relations of hospitalized children with a history of physical abuse ( $n=88$ ). TAT responses of participants, ages 7-18 years old, who were physically abused were compared to children with no reported physical abuse history. TAT responses were scored using the Social Cognition and Object Relations Scale. A General Linear Model Multivariate test of SCORS dimensions with gender and physical abuse was conducted. There were no main effects for Gender or Physical abuse, but there is a trend for Gender ( $F = 1.87$ ,  $df = 7$ ,  $p = .09$ ). However, between subjects tests showed gender as a significant predictor of understanding social causality ( $F = 5.84$ ,  $p < .05$ ) and self-esteem ( $F = 4.29$ ,  $p < .05$ )

**Name:** Fallon Kane

**Title:** *Unhealthy Dependency in the Victims and Perpetrators of Child Abuse: A Meta-Analytic Review*

**Faculty Advisor(s):** Dr. Robert Bornstein

**Abstract:** Theoretical conceptualizations of interpersonal dependency and dependent personality disorder (DPD) suggest that: 1) high levels of dependency may increase risk of child abuse perpetration in parents; and 2) children who are victimized may show increased dependency later in life (Bornstein, 2012). This study used meta-analytic techniques to examine these hypothesized links. There were 13 published studies (20 effect sizes) examining the dependency-abuse perpetration relationship in parents (overall N of perpetrators = 1,403). The dependency-abuse effect size ( $d$ ) collapsed across all moderating variables was 0.37 (Combined  $Z = 8.00$ ,  $p < .00001$ , Fail Safe  $N = 480$ ), which is considered by Cohen

(1990) to be in the medium range. There were 15 published studies (30 effect sizes) of increased dependency in victims of child abuse (overall N of victims = 38,265). The dependency-victimization relationship (d) collapsed across all moderating variables was 0.29 (Combined Z = 8.38,  $p < .00001$ , Fail Safe N = 765), also a medium effect size. These results support and extend analyses of the relationship between dependency and domestic violence (Kane & Bornstein, 2015), and confirm that high levels of interpersonal dependency are not invariably associated with acquiescence and passivity, but may also be associated with active—even aggressive—behavior. Theoretical and clinical implications are discussed, with suggestions for further research outlined.

**Name:** Sanya Masroor

**Title:** *Personality Predictors of Mating Preferences*

**Faculty Advisor(s):** Professor Lawrence Josephs

**Abstract:** The purpose of this research project is to investigate whether assortative mating theory holds true for personality style. Assortative mating is a pattern in which individuals mate more frequently than expected in a random mating pattern with others like themselves. This pattern is the opposite of the popular belief that opposites attract. The purpose of this study is to test whether individuals of a certain personality type are more attracted to likewise individuals, or individuals of the opposite personality type. Specifically, it will look at whether a typically authentic person is attracted to others of the same kind, or whether they find inauthentic or “playing hard to get” people attractive as well. The 12-item Dark Triad measure and Authenticity in Relationships Score (AIRS) is used to determine the participant’s level of authenticity and personality type. Participants are given a short vignette by random assignment in which they read about a hypothetical scenario involving a person coded as authentic or game-playing. Our hypothesis is that participants who score high on the Dark Triad measure will have a lower score on the AIRS measure and will be more frequently attracted to the less authentic type as well. Conversely, people who score low on the Dark Triad measure and high on the AIRS measure will more frequently rate the authentic coded individual as being attractive.

**Name:** Angela Schickling

**Title:** *Anxiety and Caffeine Correlational Study*

**Faculty Advisor(s):** Professor Christine Feeley

**Abstract:** The purpose of this correlational design study was to determine the correlation between anxiety levels and caffeine intake in undergraduate students. Given previous experimental research, it was hypothesized that the correlation would be positive. Caffeine intake and anxiety levels were self-reported in the form of an online survey. Caffeine levels were quantified in relative caffeine in a cup of coffee, and anxiety was scored on the Zung Self-report Anxiety scale. The correlation was found to be positive but too modest to be statistically significant. Therefore, there may be other influential factors, such as subjective levels of caffeine intake, and further related research should be done in this area to determine the best way to alleviate personal distress in anxious populations.

**Name:** Jamal Waire

**Title:** *The Role of Aspiration on Academic Performance in Middle School Males.*

**Faculty Advisor(s):** Dr. Jennifer Durham

**Abstract:** In the areas of math and reading, poor academic performance has become a pervasive issue among minority students within the school setting. A prominent and frequently discussed rationale for underachievement among minority groups is that those particular students may not aspire to achieve the desired standard of academic success within our education system. Although many researchers



acknowledge that individual student aspirations can be impactful, there is significant research to suggest that aspiration may not be an instrumental component of all student's academic performance. This study explores the nature of student aspirations in a multi-dimensional manner and measures the relationship between the student's type of aspiration and their academic performance in math and reading. Forty-eight male students entering the 6th grade at a New Jersey middle school were given a prompt in which they were asked to identify their aspirations for the upcoming year. Grounded Theory qualitative methodology was used to identify dimensions of aspirations and various patterns in the student's responses. A mixed methods approach was used by analyzing their standardized test scores in math and reading to determine the relationship between dimensions of aspiration and standardized test performance. Although many students who challenged themselves academically were high achievers, a significant number of students who shared those same aspirations for academic success did not always perform well. Some students who expressed aspirations apart from their academic pursuit did perform well on standardized tests. The dimensions of these aspirations as they relate to standardized test performance may provide results that address the types of aspirations that promote positive academic performance among minority students. Implications for future research will be discussed as the role of aspiration, if understood, can be a valuable construct for teaching professionals and school administrators.

**Name:** Laura Zaugg

**Title:** *Which Dimensions of Culture Predict Attitudes Regarding Nontraditional Sexuality? A Systematic Survey of European Nations*

**Faculty Advisor(s):** Professor Robert Bornstein

**Abstract:** A long history of discrimination directed toward individuals with nontraditional sexual orientations exists; even today, the rights of the LGBTQ community are threatened around the world. This study examines the relationship between cultural dimensions of over 30 European nations and their acceptance of LGBTQ citizens. Hofstede Center research shows that national cultures differ in unconscious values held by a majority; key dimensions include Power Distance, Uncertainty Avoidance, Individualism, Masculinity, Long Term Orientation, and Indulgence. Data regarding each nation's acceptance of nontraditional sexuality were gathered through the International Lesbian, Gay, Bisexual, Trans, and Intersex Association (ILGA) Europe database, including 6 categories (Equality Non-Discrimination, Family, Hate Crime Speech, Legal Gender Recognition, Freedom of Assembly, and Asylum), and an overall tolerance rating. Results revealed significant links between three Hofstede dimensions (Power Distance, Individualism, and Indulgence), and various ILGA tolerance. Power Distance was inversely related to ILGA Family, Legal Gender Recognition, Freedom of Assembly, and Asylum: People strive to equalize distribution of power and may support leaders who create laws to protect vulnerable groups. Individualism was positively correlated with ILGA Family, Legal Gender Recognition, and Asylum. A highly individualistic society expects people to look after self and immediate family; government is expected to represent disenfranchised people. Finally, Indulgence was positively correlated with ILGA Family, Legal Gender Recognition, and Freedom of Assembly, and negatively correlated with Asylum. This indicates that societies who do not value strict norms permit people live their own lives without judgment. All effect sizes were in the medium to large range (significant  $r$ 's ranged from .362 to .788). Findings implicate government's responsibilities and may inform public policy for LGBT citizens.

## **SOCIAL WORK**

**Section A: 8:30-9:30**

**Session 7: UC 313**

**Social Work I - Oral Presentation**

**Graduate Division**

**Name:** Sarah Acton

**Title:** *Disparate Risk Factors for Gay, Lesbian and Transgender Youth*

**Faculty Advisor(s):** Professor Newransky

**Abstract:** Lesbian, Gay, Bisexual and Transgender (LGBT) youth experience disparate rates in homelessness which increases risks for substance and alcohol abuse, victimization, trauma, mental health problems, suicide, self-injurious acts, engagement in risky sexual behaviors including survival sex and prostitution, the contraction of HIV and STDs, little or no access to healthcare, joblessness, poverty and underutilization of social services. Many LGBT youth do not access homeless shelters due to service provider and resident homophobia, insensitivity to LGBT needs, harassment, disrespect, violence and rejection. The purpose of my research is to help the reader understand these risks, propose the use of LGBT specific homeless shelters through the lens of organizational theory for the purpose hoped that such research will provide a rationale for LGBT specific shelter development. The use of Adelphi SocIndex and Proquest database, in addition to an internet search, allowed literature review and statistical information for my proposal.

**Name:** Joanna Barberii

**Title:** *The Ties That Bind: The Multifaceted Truth Behind Mobile Phone Technology and Social Networking Amongst Female Sex Workers in India*

**Faculty Advisor(s):** Dr. Subadra Panchanadeswaran

**Abstract:** Background: Female sex workers (FSWs) are embedded in a network of business exchanges and social support. Mobile phone technology can either elicit solidarity amongst FSWs and social networks or induce imminent vulnerabilities such as social control. Examining the strong and tenuous ties surrounding sex work is critical to the development of safety-based interventions.

Methods: Sixty-seven FSWs from different areas in India participated in a qualitative study. Data were collected through semi-structured, in-depth interviews and focus group discussions.

Findings: The respondent's narratives revealed themes of connectedness and vulnerability across social networks. FSWs found mobile phone technology helpful in building client relationships, sharing knowledge with peers, and reciprocating resources with business counterparts. Respondent's narratives also revealed challenges such as increased likelihood of stalking victimization, tensioned relationships with business networks, and competition experiences with peers.

Implications: These findings suggest that intervention programs should consider working with FSWs with poor social support to enhance their knowledge on available resources. Incorporating mobile phone technology in this process contributes to the empowerment and safety of FSWs.

**Name:** Nicole Delavega

**Title:** *Knowledge of Community Resources As A Tool For Decreasing Re-hospitalizations Among Substance Abuse Patients*

**Faculty Advisor(s):** Dr. Regina Tracy

**Abstract:** Substance abuse is the misuse or overuse of any substance. The readmission of patients with substance abuse problems is a growing concern for hospitals in suburban communities. This social problem inspires research into how social work practices can decrease hospital readmissions by using community resources in the long-term treatment of substance abuse. Substance abuse and the attending problems are life threatening if left untreated. This presentation will focus primarily on patients with substance abuse problems who have been discharged from a hospital and have been readmitted as a result of relapse within one year. Relapse describes a patient returning to a hospital without prior utilization of an outpatient treatment program. Providing information about available outpatient treatment programs at discharge from the hospital is anticipated to decrease the amount of times patients will return to the hospital in one year. For this study, this researchers focus will be abuse of prescription opiates. By conducting this mixed method study, we can better understand what is a more effective and practical solution to minimizing readmissions to a hospital for patients with substance abuse problems. The participants in this research study will consist of two groups; patients who receive written information at discharge about community outpatient treatment programs and patients who do not receive written information about community outpatient treatment programs. In comparing these two groups, this research will determine whether providing this information at discharge will decrease the amount of readmissions to a hospital within a year.

**Name:** Dena Gassner

**Title:** *Creating a Culturally Competent Setting for Medical and Therapeutic Care for Individuals with Autism: Upending Disparity*

**Faculty Advisor(s):** Professor Stephen Shore

**Abstract:** Considerable health care and therapeutic disparities exist for adults with autism spectrum conditions. The implications of this are evidenced in research showing high suicidation with disproportionately low therapist response for depression; crisis level of need at the time of soliciting health care treatment; terminations/ruptures in healthcare/therapeutic relationships due to disability related features, often misperceived non-compliance; high rates of end state cancers and higher rates of early death via suicide and shorter lives. Lastly, there is insufficient understanding of the frequency of gender fluidity presenting with autism and many who live at the intersectionality of LGBTQ and autism are denied dually culturally competent care.

This presentation will explore the health disparities for individuals with autism and the implications in life expectancy. We will discuss how medical and therapeutic settings can become more accessible for those experiencing either internalizing or externalizing expressions of autism. Lastly, we will discuss the desperate need for training in autism conditions for all human service providers.

Student is presenting this content March 4, 2016 at the Government Accountability Office at a summit on transition for individuals with autism.

**Section C: 10:50-11:50**

**Session 16: UC 201**

**Social Work II - ePoster Presentation**

**Graduate Division**

**Name:** Kari Tabag

**Title:** Mental Health Distress Among Asian American Students in Higher Education

**Faculty Advisor(s):** Dr. Roni Berger

**Abstract:** Since the Immigration and Naturalization Act of 1965, the Asian population in the United States continues to grow. Between 2000 and 2010, the Asian population in the United States increased by 46%. In 2012, Asian Americans constituted approximately 18.9 million of the United States population and by 2050, are projected to consist of 10% of the population. Asian Americans are a highly diverse population, as they are among 24 distinct ethnic groups with distinct experiences and histories varying in country of origin, generational status, class position, religion, gender, history of immigration, variety of dialects, and specific cultural values and norms. As such, Asian subgroups are often overlooked when conducting research.

The percentage of Asian/Pacific Islander college students in the United States is also increasing. From 1976 to 2012, the Asian/Pacific Islander student population grew from 2 to 6 percent, making them the second largest ethnic group enrolled in higher education.

For many young adults, college is a particularly stressful period of development involving many challenges and transitions. The prevalence of mental health disorders has been increasing among students attending institutes of higher learning in the United States. Compared to Caucasian American and European college students, Asian American college students present with higher rates of symptoms of depression and diagnosed depression, and are 1.6 times more likely to consider attempting suicide. Therefore, it is particularly important to understand the impact certain cultural disparities have on Asian American college students' mental health.

Using the Asian American Racial Identity Development theoretical framework, implications for identifying predictive risk factors affecting the mental health of Asian American college students are presented such as the model minority myth, self-concealment, sense of belonging, ethnic identity, intergenerational conflict, and perceived discrimination.

## ENVIRONMENTAL SCIENCES

**Section C: 10:50-11:50**

**Session 17: UC 201**

**Environmental Sciences I - ePoster Presentation**

### Graduate Division

**Name:** Dana Buckholz

**Title:** *Classification and Species Abundance of Foraminifera in Core Samples from the Canterbury Basin IODB Expedition 317*

**Faculty Advisor(s):** Professor Beth Christensen

**Abstract:** The core samples analyzed in the laboratory were collected during Expedition 317 at the Canterbury Basin, off the coast of New Zealand. This expedition is dedicated to unraveling key drivers in connection to earth's paleoclimate. These key drivers include global sea level rise, local tectonic processes and ocean currents. The Canterbury Basin is a unique location to study sedimentary rock because the strong ocean currents interfere with sedimentary deposition and foraminifera are found to

live contemporaneously to the formation of the sedimentary layers (REF). Therefore, foraminifera can aid in determining the age of the sediments and as proxies for paleoceanography conditions. This research focuses on Pliocene Benthic Foraminifera. Foraminifera are single-celled protists and exist in marine environments. They are categorized based on where they live in the ocean. Planktic foraminifera live in the water column and benthic foraminifera live in the sea floor. The identification of species relies on the characteristics of the foraminifera. Characteristics include chambers, sutures, apertures', umbilicus and septal bridges. Different species of foraminifera live in different oceanic conditions, time periods and water depths, and so assessing assemblages allows for reconstruction of past conditions. This project will focus on foraminifera from the Pliocene Epoch. Each sample is separated by size at 250 and 150-micrometer measurements. The number of divisions (splits) varies for each sample. The portions of the sample collected at each measurement are separately transferred to a picking tray and observed underneath a reflection microscope. The Foraminifera are transferred to a sample slide using a wet paintbrush. Observations made under the microscope are compared to the illustrations presented in two separate reference books to identify the Foraminifera. I expect to see changes in the water depth related to the uplift of the Southern Alps.

**Name:** Catherine Stolfi

**Title:** *Using Foraminifera to Study the Indonesian Throughflow (ITF) using Pleistocene Samples from the Northwest Shelf of Australia through Oxygen & Carbon Isotopes*

**Faculty Advisor(s):** Dr. Beth Christensen

**Abstract:** The Indonesian Throughflow (ITF) is an ocean current that exerts major control over global climate since it serves as a pathway for warm, fresh water to move from the Pacific to the Indian Ocean. This change in surface temperature directly affects atmospheric pressure and tropical thermocline. The International Ocean Discovery Program Expedition 356 extracted core samples at the Northwest Shelf of Australia in the ITF July to September of 2015. The goal was to collect a 5 million year record through sediment to study the ITF variability and climate, equatorial Pacific heat transport, Australian monsoon history, and Australian continent progression of aridity.

This project will use foraminifera as a paleoceanographic marker for the last 1 million years during the mid- to late Pleistocene period in the Northwest Shelf of Australia. The 5 species to be collected include planktonic species *G. sacculifer/ruber*, *G. crassaformis*, and *N. dutertrei/N. humerosa* as well as benthic species *Cibicides spp./Cibicidoides spp.* and *U. peregrina*. Each sample is a 20 cc of sediment from site U1460. Foraminifera can be used as proxies through the use of their calcium carbonate ( $\text{CaCO}_3$ ) shells, giving stable isotope values. The oxygen & carbon isotopic values of the calcite will be determined using mass spectrometry and my thesis will be based on the interpretation of the resulting data.

Isotope ratios of  $^{18}\text{O}/^{16}\text{O}$  and  $^{13}\text{C}/^{12}\text{C}$  contained in the shell of the foraminifera will give information about sea surface temperature (through planktonic species), bottom water temperature (through benthic species) and globalized volume of the oceans. The use of particular species reduces the variability due to biological effects. The planktonic foraminifera can be used to reconstruct the history of the thermocline and the upper water column while all species will give local water temperature information for the Northwest Shelf of Australia.

## ARTS

**Section C: 10:50-11:50**

**Session 18: UC 201**

## Arts I - ePoster Presentation

### Undergraduate Division

**Name:** Maria Calakos

**Title:** *United We Sign*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** I decided to explore linguistic diversity in a series of postage stamps to raise awareness of diversity in the United States. My grandmother, after immigrating to America from Greece sixty years ago, still sometimes transitions from speaking English into Greek without even realizing. While I was researching the different languages used around the country, I found out something that I did not realize, which is that just as there are many verbal languages, there are many counterparts to American Sign Language. This is why I've decided to solve the problem of depicting diversity using different types of sign language to raise awareness about this specific area of linguistic diversity. I plan to show four languages: American Sign Language, German, Swedish, and Italian sign in a series of original photography of people signing the word "unite."

**Name:** Meghan Cody

**Title:** *Deeper than Skin*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** My stamp entitled, ""Deeper than Skin"", addresses the topic of cultural diversity through research about cultural tattoos, and their deeper meaning that is universal among such different cultures. I researched Indian, Celtic, Native American, and Mentawai tattoos. My stamp will be solved in a series and will put the four cultures that are so similar in meaning together and show the process of applying these tattoos.

**Name:** Chidi Enyobi

**Title:** *Unity In Diversity*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** My stamp promotes cultural diversity awareness. After researching the functions and usage of rope in Mexico, The Philippines, Spain and Africa as a symbol of unifying couples together in marriages. I have chosen to use rope in different colors representing race as a symbol of cultural diversity in America.

**Name:** Dara Freeman

**Title:** *At Face Value*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** This stamp series "At Face Value," focuses on the cultural aspect of diversity. In the United States we are supposed to be seen as equals, but many of us have our own cultures and traditions. Many cultures have makeup styles that are indicative of their particular traditions. The stamps will address both "faces" of culturally diverse women and promote cultural tolerance. We are essentially the same on the outside, but we all possess a uniqueness. By photographing my subjects in their everyday "face" and their cultural "face" in paired halves it will show this dichotomy.

**Name:** Mara Gerlack

**Title:** *More Than A Cover*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** I decided to show cultural diversity through the clothing that is worn during daily routine or religious ceremonies. While walking around, even on campus, I see some Muslim students wearing Hijabs and it makes me uncomfortable just because I'm not aware of the purpose or meaning of it. I did some research on different cultures and the purpose of the symbolic garments and everything has a meaning. These religious symbols are a way to show respect or a symbol of modesty. I chose "More Than A Cover" as my title to reinforce the idea of not judging a book by its cover because people are always more than what you see. We should learn to embrace our differences because we are pretty much all the same.

**Name:** Lauren Grisetti

**Title:** *Pagan Spirit*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** When given the assignment to create a postage stamp, our theme was diversity awareness. My series is titled "Pagan Spirit", a short and sweet title to a very deep topic. As a Wiccan myself, making people aware that we are still around today, is something I would like to address. I am going to show it in the form of original photography, using Pagan symbology and the proper setup for a Wiccan ritual, as well as using my model to show the proper representation of a witch. This series is meant to show what Paganism is and not what it is made out to be.

**Name:** Marissa Lucci

**Title:** *Diversity in Stories*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** The design problem given was to raise awareness of diversity in the United States. To me, diversity is best represented through the sharing of stories. In this series of stamps, I will be showcasing four individual's stories through the items that most succinctly describe them. Each story will be representing a different type of diversity. These items not only describe the individual's type, but also how it has influenced their story.

**Name:** Samantha Pastore

**Title:** *Built By Generations*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** My stamp, "Built By Generations", focuses on the issue of age diversity in our society. There are multiple differences between the generations, and the younger generations tend to take the older ones for granted. I originally wanted to focus on the importance of older generations, but then I realized that solely focusing on one generation would not be effectively addressing the overall issue, so I shifted the focus to cooperation between generations. Each generation plays a part in building America, so through the use of original photography, I wanted to portray the hands of both the older generation and the younger generation forming a wall together. The use of a brick overlay is meant to reinforce the strength and longtime stability of what has been built by these generations.

**Name:** Katherine Volpe

**Title:** *The Color of Cityscapes*

**Faculty Advisor(s):** Professor Jennifer Maloney and Professor Kellyann Monaghan

**Abstract:** For Adelphi University's 2016 Research Conference, I am presenting my recent undergraduate work as a BFA Studio Art Major. This journey is not successfully complete without the research of other

established artists and their relatable painting techniques. The process of finding a subject matter to work from is no simple task. I have chosen to oil paint using my realist/impressionist style to recreate an aerial view of the New York cityscape. Breaking up the blended chaos into separate blocks of muted colors presents the incredible fragility of these strong standing buildings. I, as the artist, feel a responsibility to metaphorically build each tower, adding each piece to the systematic puzzle. Buildings closer to the viewer are in focus, while that crisp clarity dissipates as the eye reaches the towers in the background. The atmospheric perspective is one of the most important aspects of each painting, which is emphasized in the works of several contemporary artists. My landscape and cityscape paintings are fueled by Diana Horowitz, Richard Estes, Eric Aho, Rackstraw Downes, and Antonio Lopez Garcia. Each of the artists I have researched added a crucial element of discovery to the learning process of painting.

**Name:** Lindsey Wagner

**Title:** *Interfaith Generation*

**Faculty Advisor(s):** Professor Dale Flashner

**Abstract:** When I was given the assignment to create a postage stamp based around diversity awareness, I began to wonder which component to delve into. Religious diversity in America is a topic that will always be relevant because this country is truly a melting pot of different cultures and beliefs. The topic I chose to focus on is the mixing and literal marrying of religions, and how younger generations have embraced their dual religion upbringing. The idea stemmed from growing up in a household that annually celebrated “Jewish Christmas.” Each year my family gathers around the table to say the Jewish prayers for Hanukah, and saying grace right before we eat. I have always loved observing two different religions because it promotes the idea that with each new generation comes change and adaptation to their family’s beliefs. After researching thoroughly I discovered how there are other 20-somethings in this country who have grown up experiencing two very religious backgrounds. My stamp hones in on pieces of jewelry that combine two religious symbols, to further support the idea that people are taking control of their beliefs and making choices for themselves, while still respecting their family heritage.

## HUMANITIES

**Section B: 9:40-10:40**

**Session 14: UC 216**

**Humanities I - Oral Presentation**

**Undergraduate Division**

**Name:** Jazmine Javier

**Title:** *Cultural Resistance as a Form of Slave Rebellion in Jamaica*

**Faculty Advisor(s):** Professor Marsha Darling

**Abstract:** Mainstream history often ignores the various social analyses that contribute to a holistic understanding of slavery in the Caribbean. These gaps are usually the important contributions of African History, Black History, and Women’s History. An intersectional analysis via these lenses is needed to better understand forms of cultural resistance in Jamaica. Duncombe’s Theory of Cultural Resistance will provide the main theoretical framework in how cultural solidarity becomes a mode for political resistance and empowerment. By keeping African traditions in music, language, religion, and other



cultural aspects, Black people in Jamaica were able to maintain a sense of identity beyond that of a commodity. The key role of women, especially Black women, using non-violent forms of resistance is often overlooked. Since women are the gatekeepers of culture, it is important to highlight their role leading up to emancipation as well. If we are to understand culture as power, cultural resistance in Jamaica provided a strong foundation for enslaved persons to rebel against institutional slavery.

**Name:** Shane Pastore

**Title:** *The Challenge of Being a Slave Mother*

**Faculty Advisor(s):** Professor Zaccarini

**Abstract:** My stamp, "Built By Generations", focuses on the issue of age diversity in our society. There are multiple differences between the generations, and the younger generations tend to take the older ones for granted. I originally wanted to focus on the importance of older generations, but then I realized that solely focusing on one generation would not be effectively addressing the overall issue, so I shifted the focus to cooperation between generations. Each generation plays a part in building America, so through the use of original photography, I wanted to portray the hands of both the older generation and the younger generation forming a wall together. The use of a brick overlay is meant to reinforce the strength and longtime stability of what has been built by these generations.

**Name:** Matthew Rakowski

**Title:** *Abstract Divided and Unconquered: How Competing Interests and Priorities Prevented the Subjugation of Ireland*

**Faculty Advisor(s):** Professor Reno

**Abstract:** The central question of my research is the degree to which the competing interests of the kings of England and their vassals undermined England's attempts to subdue medieval Ireland. An examination of primary sources, including the writings of Gerald of Wales and The Song of Dermot and the Earl, shows that kings constrained their vassals' efforts in Ireland to protect the interests of the crown. Through a policy of divide and rule, kings granted lands to rival vassals to play one vassal off the other in an attempt to ensure no one vassal would become too powerful as to pose a threat. The result was an incomplete conquest where, even at its height in 1240, no more than two-thirds of Ireland was under English control because Ireland was just one of many priorities for the realm and often eclipsed by more pressing concerns.

The research will leverage the contributions of R.R. Davies, Robin Frame, James Lydon, Sean Duffy, Goddard Henry Orpen, and A.J. Otway-Ruthven as well. The picture that emerges is one of self-interest, ambition and short-term thinking that led to a chaotic and ultimately incomplete conquest.

**Name:** Conor Roan

**Title:** *Byzantium and Bulgaria: How an Empire Created its Greatest Threat*

**Faculty Advisor(s):** Professor Edward A. Reno III

**Abstract:** The Byzantine Empire is typically described as in near constant conflict with the Arab Caliphates that dominated the Middle East, especially when one considers the fact that Byzantium was ultimately conquered by the Ottoman Caliphate. There is a strong religious connotation attached to these conflicts, and said conflicts were but one of many religious struggles that permeated the Middle Ages. However, this presentation will discuss what should be considered as the most important series of conflicts that Byzantium was ever a part of: its rivalry and various wars with the Tsardom of Bulgaria. For while Byzantium fought for control of Anatolia and Syria with the Caliphates, they battled for their

continued existence against the Bulgarians, facing siege after siege of Constantinople, seat of the Empire. Upon review and analysis of Byzantine texts such as the theophanes Continuatus, as well as a comparison the Bulgarian Common Law and Byzantine Ecloga, it will become clear that, although Byzantium sought to create a satellite in the Balkans to serve as a buffer against further nomadic incursions into Imperial territory, they failed in their efforts. Despite using practices that had long sustained the Empire against prior enemies, such as diplomatic manipulation, and new practices, like religious subjugation, Byzantium failed to solidify its hold over the Bulgarian state. Instead, Bulgarian rulers were able to take these efforts of diplomatic and religious manipulation and adapt, allowing them to dominate the Balkans and challenge Byzantium for the title of Roman Emperor.

**Section C: 10:50-11:50**

**Session 20: UC 215**

## **Humanities II - Oral Presentation**

### **Undergraduate Division**

**Name:** Rebecca Gotterbarn

**Title:** *The Lesser Evil: Comparing the Relationship of Slaves Between the Catholic and Baptist Churches*

**Faculty Advisor(s):** Professor Cristina Zaccarini

**Abstract:** This presentation compares the relationship of slaves between the Catholic and the Baptist church in the antebellum period of the American South. In an environment where slaves had little to no control over their daily lives, their choice of religious following was one where they maintained a modicum of control. The Catholic Church, restrained by their desire to rise and expand in the slaveholding south, adopted a slave-apologist rhetoric in order to please the very plantation owners they wished to convert. On the other hand, the Baptist church gave slaves a small semblance of freedom never offered to them before, which was enough for the church to make a large impact on African American life. The results of the vastly different approaches regarding the religious education of slaves by the churches and the slaves' subsequent response can be seen in modern day African American life. Through analyzing slave narratives, census data, and modern day historians work, this presentation aims to explore the policies of both churches towards the bondsmen.

**Name:** Morgan Faye Neuhedel

**Title:** *""Whatever the slave did affected the master, and whatever the master did affected the slave""*

**Faculty Advisor(s):** Professor Cristina Zaccarini

**Abstract:** "Whatever the slave did affected the master, and whatever the master did affected the slave" How Masters fostered their own interests within the Lives of Slaves. This presentation will discuss how masters fostered their own interests in the lives of their slaves. Some of the ways masters did so were by manipulation of food, slave communities, and also the violence that took part within these slave communities, and church services. Masters were only concerned with taking care of their property, or rather investment. Thus what they did could have been beneficial to slaves. Masters would feed their slaves to prevent slaves from raiding other plantations and causing a problem, and even feed the children of slaves well so they could grow into strong, able workers. Slave communities sprang up with

the help of masters because masters would allow slaves to marry for entertainment and breeding purposes. Violence occurred within slave communities over women, family and most importantly, property, since slaves had so little to begin with. Masters allowed slaves to attend church services with them to care for the master's children or to serve any other needs of the master. Religion was allowed among slaves, but it was a modified religion; in other words, slaves were only told to obey their master and not to steal. Slaves were unable to learn to read or write, therefore the Gospel message was limited and their services were monitored. Some slaves knew that they were not receiving the real Gospel message, but a forged message to fulfill the desires of the master. Masters gave the pretense of being "the good guys" but all of their actions were selfish. The masters were only concerned with preserving their investment, their property.

**Name:** Sarah O'Connor

**Title:** *Madame Restell: Taking Advantage of Purity*

**Faculty Advisor(s):** Professor Cristina Zaccarini

**Abstract:** This project examines how the concept of purity, an important aspect of the cult of true womanhood, affected the midwife, Madame Restell, in nineteenth century New York City and how this woman used and benefited from this idealized concept. This midwife, widely known to be an abortionist, developed a successful business and became one of the wealthiest individuals in New York City. Society considered Madame Restell impure because of the services she provided women— however, women sought out these services as a way of maintaining their own pure reputations. This research studies the public's perceptions of Restell to address this incongruous relationship between purity and impurity. Next, an examination of the economic benefits of Restell's business shows how Restell sacrificed her reputation in order to capitalize on the morality of the times. Finally, this research examines her trial from 1847, after her arrest for second degree manslaughter, to evaluate how these nineteenth century values influenced court decisions. Birth control advertisements, newspaper critiques, and court testimony reveal that the impure Madame Restell took advantage of societies' ideals and used them to her gain.

**Name:** Alexandra Wurglics

**Title:** *Colonial America: Traditional Women's Roles Become Wedge for Change*

**Faculty Advisor(s):** Professor Michael LaCombe

**Abstract:** Much research has been done about American colonial women and their traditional roles in society during the pre-revolutionary era. Historians discuss the domestic jobs that women held as well as the motherly characteristics that they were expected to have. At this time, women were given no political power and had no major influence over any other group of people.

When the American Revolutionary era first emerged, however, instability in the colonies, coupled with the desire to be educated and literate, allowed for many women to use their traditional social standing as a wedge to expand their roles. This research project aims to shed light on three specific upper class women, Eliza Lucas Pinckney, Penelope Barker, and Abigail Adams, and their attempts to gain power before the revolution. By studying numerous primary and secondary sources, most specifically letters written by and to these women, it is evident that they had more progressive, defining roles at a time when society was still very narrow-minded. The letters discussed their roles as deputy husbands, caring for agricultural affairs in place of their husbands, and even included the political influence that some had over the men in their lives.

Pinckney became the first woman to introduce the cash crop indigo in South Carolina because she was a deputy husband. Barker arranged the Edenton Tea Party, the first political act organized by women in order to boycott British goods. Adams was married to John, a politically active husband. Through her letter writing and encouraging words, she influenced many of John's political ideologies in many different ways, including promoting better domestic laws for women and the necessity of the revolution. After studying these three women, it is clearly evident that some females did in fact use their domestic roles to push for more power.

## LIFE SCIENCES

**Section A: 8:30-9:30**

**Session 4: UC 213-214**

**Undergraduate**

**Life Sciences I - Oral Presentation**

**Undergraduate Division**

**Name:** Sierra Beck, Samantha Muellers, & Annie Laurie Benzie

**Title:** *Adenosine/guanosine nucleoside ribohydrolase is a distinct and druggable antitrichomonal target*

**Faculty Advisor(s):** Professor Brian J. Stockman and Professor David W. Parkin

**Abstract:** The parasitic protozoan *Trichomonas vaginalis* infects about 170 million people worldwide with an estimated 5% of cases being reported as resistant to existing 5-nitroimidazole drugs. Nucleoside salvage pathway enzymes used by the parasite are being explored as new targets for therapeutic intervention. The first step in this pathway is the hydrolysis of nucleosides to release the nucleobases. A <sup>1</sup>H NMR-based activity assay was developed for the purine-specific adenosine/guanosine nucleoside ribohydrolase (AGNH) and used to screen the NIH Clinical Collection. Eight compounds were identified with IC<sub>50</sub> values = 10 μM. Five are structurally related and belong to the flavonoid class of compounds: hyperoside, isoquercitrin, rutin, (+)-taxifolin, (±)-taxifolin. Activity was confirmed in counter screens run in the presence of detergent thus indicating that inhibition by these promiscuous compounds is specific and not aggregation-based. The adenosine analogs 2-chloroadenosine, 2-chloro-N(6)cyclopentyladenosine, and 2fluoroadenosine were also identified as inhibitors. These compounds may prove to be useful tools to explore the reaction mechanism since the halogen substitution at the 2 position of the adenine ring may distort compound binding to the extent that the proposed oxocarbenium-ion-like transition state is no longer favorable. Collectively, the AGNH inhibitors are structurally distinct from inhibitors identified previously for the pyrimidine-specific uridine ribohydrolase (UNH) thus indicating that AGNH is a distinct and druggable target from UNH. Smaller fragments of the active compounds are currently being investigated in order to determine the structure-activity relationships that define the pharmacophore.

**Name:** Alyssa Costa

**Title:** *Elongation Enables Aquatic and Terrestrial Locomotion*

**Faculty Advisor(s):** Professor Andrea Ward

**Abstract:** Extreme body elongation has evolved multiple times within actinopterygian and sarcopterygian fishes. While this specialized body plan has been associated with living in highly

structured habitats, many elongate fishes are also known to make terrestrial excursions. Here, we investigated how two elongate species, ropefish (*Erpetoichthys calabaricus*) and eel catfish (*Gymnallabes typus*), with different types of axial elongation move aquatically and terrestrially. Specifically, we examined how these species use vertical substrate in their environment by conducting aquatic and terrestrial locomotor trials where fish traveled through an array of cylindrical pegs spaced at different intervals. We predicted that ropefish, which have an elongate precaudal region, would spend more time contacting pegs than eel catfish, which have an elongated caudal region. Individuals completed both aquatic and terrestrial trials at two different peg-spacings. In general, both fish were found to move through the peg array similarly to limbless tetrapods. At the smaller spacing, individuals spent more time, on average, contacting a peg during a terrestrial trial than during an aquatic trial. Additionally, more of the body contacted the peg when the animal was moving terrestrially. Despite differences in their axial patterning, ropefish and eel catfish exhibited similar changes in locomotory patterns when traversing the terrestrial environment. However, these species did differ in speed and contact time; ropefish moved more slowly and contacted pegs for longer durations than eel catfish. This study provides further understanding of how elongate fishes can use axial undulation to move on land. In on-going studies, we are examining how these fishes move between environments.

**Name:** Yuriy Ostrozhynskyy, John Mavroudes, & Tara Pena

**Title:** *Effect of Magnetic Field on Mitochondrial Physiology in Drosophila melanogaster*

**Faculty Advisor(s):** Dr. Eugenia Villa Cuesta and Dr. Matthew Wright

**Abstract:** Electromagnetic fields have an impact on the aging, health, and reproductive success of different organisms. Increased levels of electromagnetic radiation have been shown to decrease fecundity and lifespan, and increase the production of reactive oxygen species (ROS) in *Drosophila melanogaster*. ROS are a bio-product of mitochondrial respiration that, in excess, can damage cellular components causing genotoxic effects. However, little is known about how mitochondria detect high magnetic fields and, and the effect of zero magnetic fields on organisms.

In this research we generated high, low and zero electromagnetic fields to study the effect on climbing ability and metabolic rate of *Drosophila melanogaster*. Our data shows that high magnetic field significantly impairs the climbing ability of fruit flies, while the effect of zero magnetic field, although also detrimental, was not statistically significant. Zero magnetic field had tendency, but not a significant impact on climbing ability. Since climbing is energetically expensive, and most of the cellular energy demands are created by the mitochondria, we measured metabolic rate which is an indicator of mitochondrial respiration. We found that high magnetic field significantly increased metabolic rate, while zero magnetic, once again, did not have a clear effect on metabolic rate.

Overall our data suggests that magnetic fields influence mitochondrial physiology, and therefore health homeostasis. Since we are exposed to changing electromagnetic fields, understanding the effect of magnetic fields on health is of key importance, especially in space travel, where changes in magnetic field is more pronounced.

**Section B: 9:40-10:40**

**Session 8: UC 201**

**Life Sciences II - ePoster Presentation**

**Graduate Division**

**Name:** Carlos Ballon

**Title:** *Predator Cues affects mud crab consumption rates*

**Faculty Advisor(s):** Aaren Freeman

**Abstract:** Predator Cues affects mud crab consumption rates. The Xanthid crab, *Eurypanopeus depressus* has been well established along the North Atlantic coast of the United States, inhabiting intertidal oyster reef ecosystems. The species utilizes the Oyster Reef habitat to not only scavenge for food but to also use as refuge from potential predators. In order to survive in these ecosystems prey must balance between actively foraging, acquiring and consuming food for energy, and performing anti-predator behaviors necessary for survival. A classic example of a fitness trade-off, prey carrying out anti-predator behaviors often is successful in avoiding predators, but at the cost of obtaining energy. Organisms such as the *E. depressus* developed character traits that allow the organism to identify when predators are near through identifying chemical cues. The chemical cues released by potential predator alert prey when a predator is near facilitating an anti predator response. However, with the introduction of a novel predator such as the *Hemigrapsus sanguineus* naïve prey may not respond appropriately to the novel predator's presence. In this experiment predation cues from *H. sanguineus* were introduced to *E. depressus* to study the behavioral affects. This study aimed to observe how the release of an alarm cue would either decrease or have no affect on the consumption rate of *E. depressus*. Preliminary results have thus far indicated that prolonged exposure to predation cues cause crabs to consume less as opposed to being exposed for short periods of time.

**Name:** Aisha Farooq

**Title:** *Characterization of a Novel Type of Cytokinin Receptor*

**Faculty Advisor(s):** Alexander Heyl

**Abstract:** Cytokinins are a class of phytohormone that are involved in several cellular processes such as, cell proliferation in the root and shoot portion of a plant. Previous studies have proven that cytokinin signals are relayed through histidine kinase (HK) receptors found on the plasma membrane and ER, which cascade the signal down to the nucleus to eventual protein production via a two-component signaling system. The basic structure of any HK receptor involved in cytokinin signal transduction contains a CHASE (cyclase histidine kinase-associated sensory extracellular) domain and a histidine kinase domain; CHARK (CHASE domain receptor-like serine/threonine kinase), found in rice, contains a CHASE domain but instead of a HK it has a serine/threonine kinase domain. In this study we will characterized the downstream components of CHARK by analyzing the protein-protein interactions of CHARK. The investigation of CHARK will include both a genetic analysis, via the yeast-two-hybrid method, as well as a biochemistry analysis, using a pull down assay. Uncovering the interactions of CHARK's downstream components, will lead to a better understanding of this new class of putative cytokinin receptors.

**Name:** Lauren Kenna

**Title:** *DNMT Expression in Diabetes*

**Faculty Advisor(s):** Professor Eitan Akirav and Professor Tandra Chakraborty

**Abstract:** Dysfunction due to epigenetic changes such as insulin deficiency, glucose intolerance and insulin resistance and can contribute to diabetes. DNA Methyltransferase (DNMT) is an enzyme responsible for adding methyl groups to the 5th carbon in cytosine bases in CpG islands resulting in epigenetic modifications. We hypothesize excessive DNA methylation in diabetes is mediated by an elevation in DNMT expression in the pancreatic islet. Pancreatic sections and blood samples were obtained from 8-

10,12-14, and 16 week non-obese diabetic mice, a model (NOD) of human type 1 diabetes (T1D). Intraperitoneal Glucose Tolerance Test (IPGTT) was performed the day of animal sacrifice to measure blood glucose control and show disease progression as the animal age increases. To evaluate the global changes in DNMT1 expression, whole pancreatic tissue was lysed and mRNA extracted for real time RT-PCR. Gene expression analysis was done for insulin2, DNMT1 and B-Actin. Our findings show that DNMT1 expression levels were increased by ~3.5 fold over time while insulin 2 decreased ~5 fold in week 16 group relative to young and healthy animals. Histomorphologic analysis of DNMT1 positive area relative to insulin positive area was measured using ImageJ. The percent of DNMT1 positive area was increased ~45% in diabetic islets versus early age NOD islets at week 8. Most of this increase was attributed to the large infiltrate with DNMT1 in the diseased animals, but independent measures of insulin positive area versus infiltrate area still shows an increase in DNMT1. Our data show that DNMT1 is expressed in higher levels in diabetic pancreatic islets of NOD mice than healthy islets, suggesting that DNMT1 may contribute to gene silencing the islet. Future studies designed to isolate different islet cell types and infiltrating immune cells would provide a more detailed picture of the dynamic of DNMT1 activation in the process of autoimmune diabetes.

**Name:** Amber Notaro, Danielle Bolognini, Christina Chahal, Jeevan Kamboj, & Erin Doherty

**Title:** *Advances in zebra fish behavior*

**Faculty Advisor(s):** Matthias Foellmer

**Abstract:** Research on the adaptive significance of behaviors in fishes has contributed fundamental insights into the evolutionary dynamics of key processes such as sexual conflict, sperm competition, and mate choice. Here we present the results of a novel study adding to our understanding of behavior evolution in zebra fish (*Danio rerio*), an important model organism in developmental biology.

**Name:** David Perrotto

**Title:** *The Effect of Lowering VHL on PC-12 Cells*

**Faculty Advisor(s):** Professor Alan Schoenfeld

**Abstract:** The von Hippel-Lindau (VHL) tumor suppressor gene is found on chromosome 3p25.5 and is associated with the inherited disease VHL disease. Germ line mutations in VHL predispose the affected individual to develop both malignant and benign tumors in the kidneys, retina, pancreas, central nervous system, testes, inner ears, and adrenal glands. Although loss of VHL causes adrenal gland tumors (pheochromocytoma), there does not exist a good cell model to study this aspect of VHL disease. The CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)-Cas 9 system is responsible for guiding the Cas 9 protein for sequence specific recognition and cleavage of target DNA complementary to the guide sequence. Here, the CRISPR-Cas system will be used to cause mutational inactivation of the VHL gene in cells of adrenal origin. Thus, this research will attempt to see the effects of using the CRISPR-Cas 9 system to lower the expression of the VHL gene in PC-12 adrenal neural cells.

## Undergraduate Division

**Name:** Walishah Ahmadi

**Title:** *Rapamycin's effect on Metabolism varies in D. melanogaster and D. simulans mtDNA in Drosophila*

**Faculty Advisor(s):** Professor Eugenia Villa-Cuesta

**Abstract:** Disorders regarding metabolism are a frequent problem in human health. Here, we study

metabolism using *Drosophila* as the model system. To study metabolism in *Drosophila*, we examine the mTOR (mechanistic target of rapamycin) pathway and its inhibitor, a drug called rapamycin. mTOR is a serine/threonine protein kinase responsible for cellular metabolism and cellular growth. Deregulation of the mTOR pathway cascade by rapamycin has similar beneficial effects as dietary restriction. In this experiment we analyzed oxygen consumption as an indicator of the basal metabolic rate of flies exposed to rapamycin. Our experiments showed that rapamycin lowered the consumption of oxygen of normal flies consisting of *Drosophila melanogaster* mitochondrial and nuclear DNA (p-value = 0.008). However, the consumption of oxygen of introgressed flies consisting of a *Drosophila simulans* mitochondria and *D. melanogaster* nuclear DNA was not significantly -altered to rapamycin (p-value = 0.064). Overall this research indicated that the effects of rapamycin on the basal metabolic rate of *Drosophila* are dependent upon the type of mitochondria present in the whole organism

**Name:** Omar Altieri, Samuel Ilyayev, Brian Kim, & Jenna Permaul.

**Title:** *Sexual selection and conflict in mealworm beetles*

**Faculty Advisor(s):** Matthias Foellmer

**Abstract** Research on the adaptive significance of arthropod behaviors has contributed fundamental insights into the evolutionary dynamics of key processes such as sexual conflict, sperm competition, and mate choice. Here we present the results of a novel study adding to our understanding of behavior evolution in mealworm beetles (*Tenebrio molitor*).

**Name:** Brian L. Cruz, Cody N. Camacho, & Santino Mauceri

**Title:** *Sexual selection, sexual conflict and diet in lobster roaches*

**Faculty Advisor(s):** Matthias Foellmer

**Abstract:** Research on the adaptive significance of arthropod behaviors has contributed fundamental insights into the evolutionary dynamics of key processes such as sexual conflict, sperm competition, and mate choice. Here we present the results of a novel study adding to our understanding of behavior evolution in lobster roaches (*Nauphoeta cinerea*).

**Name:** Michael, J. Del Latto, Christen Clark, Sara Cole, & Yvonne Liang

**Title:** *Advances in Arthropod Behavior*

**Faculty Advisor(s):** Matthias Foellmer

**Abstract:** Research on the adaptive significance of arthropod behaviors has contributed fundamental insights into the evolutionary dynamics of key processes such as sexual conflict, sperm competition, and mate choice. Here we present the results of a novel study adding to our understanding of behavior evolution in arthropods.

**Name:** Emma Gazzara

**Title:** *An investigation of the relationship between PKC $\beta$  and VHL-mediated cellular phenotypes in renal cells.*

**Faculty Advisor(s):** Dr. Alan Schoenfeld

**Abstract:** Von-Hippel Lindau (VHL) syndrome is an inherited cancer syndrome that produces tumors in the central nervous system and renal cells, among others. A mutation in the VHL gene leads to the expression of this syndrome. The VHL protein is a tumor suppressor protein that works with other proteins to rid the cell of the HIF-2  $\alpha$  protein. VHL acts through a complex of five other proteins that target proteins for ubiquitination and degradation. Protein kinase C (PKC) is an enzyme that controls the function of other proteins. The PKC group is consistent of many different isotypes in living organisms.



Studies have previously determined that VHL binds to the novel PKC epsilon isotype. PKCε has been reported to have certain cellular roles that correlate to VHL function. Therefore, it is expected that VHL binds to and stimulates activity of PKCε. This project aimed to determine the relationship between the VHL protein and PKCε in the cell. PKCε was expressed in VHL-positive and VHL-negative 786-O cells through retroviral transfection. Through a series of western blots, successful overexpression of PKCε was observed through appearance of an HA band in only VHL-positive and VHL-negative cells transfected with the retroviral plasmid containing HA-PKCε DNA. It was determined that levels of PKCε are lower in VHL-positive cells, and that PKCε levels are also lowered in VHL-positive cells treated with a proteasome inhibitor, suggesting that this lowering is not occurring through degradation. Cyclin D-1 levels were shown to be lower in VHL-positive cells, with slightly higher levels in cells with PKCε. P-27 levels were shown to be lower in VHL-negative cells, also with slightly higher levels in cells with PKCε. It was also shown that while VHL-positive cells lower amounts of both α-5 integrins and β-1 integrins, PKCε has no effect on levels of either integrin. This project is continuing to work to determine the relationship of VHL and PKCε in renal cell.

**Name:** Veronica Grebe & Ezer Castillo

**Title:** *A study of the effects of cooked banana on Drosophila melanogaster through climbing, developmental time, and flying assays*

**Faculty Advisor(s):** Dr. Eugenia Villa-Cuesta

**Abstract:** Food consumption is an important factor in determining an organism's quality of life. The more nutritional and high quality the food is, the better the organism will function. Thus, it is important to understand if cooked food is any different in quality when compared to food at room temperature, as the food quality can affect the organism- including humans- unknowingly. This study considers the effects of cooking banana on the quality of life of a model organism: the wild type strain of *Drosophila melanogaster*, a species of fruit fly. By performing a developmental time assay, climbing assay, and flying assay, it is possible to assess how banana cooked at various temperatures affects the fruit fly. The results of the assays at most imply a trend that cooking the banana improves the amount of offspring and developmental time of the flies, but additional trials are needed in all three assays in order to make any statistically meaningful conclusions.

**Name:** Eda Gulu

**Title:** *An investigation of PKC-Gamma as a target of pVHL for ubiquitination in renal cells*

**Faculty Advisor(s):** Dr. Alan Schoenfeld

**Abstract:** Von Hippel-Lindau disease is a hereditary cancer that causes tumors in the brain, spinal cord, kidney and renal organs. It is caused by a mutation of pVHL a tumor suppressor gene. Inactivation of the VHL gene leads to the hereditary cancer. Under normal conditions the VHL gene controls what proteins need to be made to function with the VCB-CUL2 complex which functions as an ubiquitin ligase (E3) and degrades proteins which are no longer needed. A known target for the complex is hypoxia inducible factor - 2α. In cells deficient in VHL proteins it was found that the VCB-CUL2 has other targets. Research has also shown that the VCB-ubiquitin ligase is responsible for down-regulation of activated αPKC via the ubiquitin proteolytic pathway. However, the antibody that was used in this research cross-reacts with PKC-gamma (PKCγ), suggesting that VHL may regulate PKCγ. Our objective was to analyze if PKCγ is a target of pVHL for ubiquitination through its E3 ubiquitin ligase for degradation and to determine the relationship between PKCγ and VHL. Using retroviral infection, PKCγ was introduced into 786-O cells which were VHL negative or positive. Using 786-O cells different experiments were done to determine

the interaction between VHL and PKC $\gamma$ . It was found that VHL negative cells up-regulate the expression of both  $\alpha 5$  and  $\beta 1$  integrin's. Expression of PKC $\gamma$  slightly decreased  $\alpha 5$  integrin levels. It was determined that Cyclin-D1 levels were up-regulated in 786-O VHL negative cells. Interestingly the expression of PKC $\gamma$  slightly increased Cyclin-D1 levels in VHL negative cells. VHL positive cells also depicted an up-regulation of p27. The expression of PKC $\gamma$  did not have an affect on p27. Further work will be done to analyze the relationship between PKC $\gamma$  and VHL.

**Name:** Alexis Haddad

**Title:** *The Pushing Force of Ropefish on Terrestrial Environments*

**Faculty Advisor(s):** Dr. Andrea Ward

**Abstract:** Highly elongate fish are often known to make terrestrial excursions and ease their movements using substrates. Previous work on limbless tetrapods (e.g. snakes) has shown that these animals use pushpoints in the environment for forward propulsion. In this study, we hypothesize that ropefish would have greater pushing force during terrestrial locomotion than during swimming. We are currently collecting force data from five individuals traversing a 5.0-cm grid peg array. This study will increase the understanding of how aquatic organisms move in terrestrial environments as well as gain a better understanding in the movement of snake-robots for anatomical medical advances.

**Name:** Manreet Kaur, Alexzandra Henaghan, & Himlir Louima

**Title:** *Influence of Predation on The Foraging Habits of Crabs and Sea Stars*

**Faculty Advisor(s):** Professor Aaren Freeman

**Abstract:** Predation is an important ecological and evolutionary force in marine intertidal ecosystems. The organisms used were snails (*nucella lapillus*) found in the rocky shore sites in the coastal of Maine which varies morphologically. The invasive European green crabs (*carcinus maenas*) and native sea stars (*asterias Rubens*) found in the Darling Marine Center. The purpose of this experiment was to determine if there was any change in foraging patterns of the crabs or the sea stars due to the presence of the other competitor. The morphology (thicker shell, aperture length, etc) of the *nucella* has been evolving to reduce the attack of the crabs by winking or crushing, but in doing so, this may be making it easier for the sea stars to prey on them. Darwinism's natural selection indicates which *nucella* survive and which get consumed. The foraging habits of both species was analyzed in August 2014 and 2015 and it was found that while the starfish consumed fewer *nucella* than the crabs, there was no change in how many snails each predator ate when they were forced into competition.

**Name:** Alison Miller

**Title:** *Opsin Genotyping and Photopigment Reconstitution of Red-Ruffed Lemurs (*Varecia rubra*)*

**Faculty Advisor(s):** Professor Shoji Kawamura (Evolutionary Anthropology Laboratory, Department of Integrated Biosciences, Graduate School of Frontier Sciences, the University of Tokyo)"

**Abstract:** Color vision depends on the ability to discern light by contrasts in the wavelength or hue. In both lemurs and humans, visual receptors called opsins are one of the five senses encoded by genes from the G-protein coupled receptor (GPCR). Its seven transmembrane structure allows for the application of related experiments that involve forced expression of cloned genes and reorganization of functional receptors into cultured cells (*E. coli*) that are foreign (heterologous) to expressing the gene of study or assembly of the receptor encoded by that gene. Primates (including lemurs and humans) are the only mammals that have trichromatic vision. This phenomenon is due to diversity among the L/M opsin alleles of the single-locus X-linked gene. All males are dichromatic and females are either dichromatic or trichromatic. The species of study, *Varceia rubra*, is one of the lemur species that follows

this pattern of sex-determined color vision. Three individual's from a captive *V. rubra* population had DNA extracted from fecal samples. Extracted DNA was used for PCR and mutagenesis experiments. Performed BOV RH1 and *V. rubra* MWS photopigment reconstruction. Of the three individuals, the female had the polymorphism for trichromacy and the two males were dichromatic.

**Name:** Samantha Muellers, Sierra Beck, & Annie L. Benzie

**Title:** *Adenosine/guanosine preferring nucleoside ribohydrolase: From flavonoids to fragments*

**Faculty Advisor(s):** Dr. Brian J. Stockman and Dr. David W. Parkin

**Abstract:** Trichomoniasis, caused by the parasitic protozoan *Trichomonas vaginalis*, is the most prevalent, non-viral sexually transmitted disease in the United States. The parasite has shown increasing resistance to the current 5-nitroimidazole therapies indicating the need for new therapies with different mechanisms. Since *T. vaginalis* is unable to synthesize purine and pyrimidine rings de novo, it relies on salvage pathway enzymes such as adenosine/guanosine preferring nucleoside ribohydrolase (AGNH.) The NIH clinical collection was screened for inhibitors of AGNH using <sup>1</sup>H NMR to monitor the reaction between the compounds and the enzyme. Five inhibitors that belong to a class of drugs known as flavonoids were discovered with IC50 values less than 10  $\mu$ M. This finding validates AGNH as a druggable target. However, the flavonoids are poor starting points for drug design since they have relatively low ligand efficiency. A fragment based approach might circumvent this limitation and lead to compounds better optimized for the ribose and nucleobase binding sites. Smaller fragments of the flavonoids that retain activity and have higher ligand efficiency indicate the potential of a fragment-based drug design approach. This poster will describe our results to date and outline our project path plans. A 2,000 compound fragment library provided by AstraZeneca will leverage the success of our project.

**Name:** Megan Ossmann, Rahanna Khan, Ashuana Lall, & Megan Velsor

**Title:** *Differences in algae cover, coral bleaching, and water nutrient levels between Shark Bay and South Shore of Heron Island, Australia*

**Faculty Advisor(s):** Professor Beth Christensen, Professor Andrea Ward, Professor Aaren Freeman and Professor Matthias Foellmer

**Abstract:** The Great Barrier Reef (GBR) is subject to changes in reef quality due to human impacts. We studied the southern and eastern shorelines of Heron Island, Australia, two areas with varied levels of human interaction, to compare reef composition and quality in terms of macroalgae cover, coral bleaching, and nutrient levels. At intervals of 5 meters along 25 meter transect lines into the reef, we used a square meter quadrat to enclose the study location. At each location we captured an aerial photograph and collected interstitial water via syringe. We later tested the water samples for nitrates, nitrites, and phosphates and analyzed the aerial photograph for relative algae and coral cover with ImageJ software. Macroalgae and coral cover were more abundant on the southern shore in comparison to the eastern shore, while coral bleaching and nutrient levels were the same in both study areas. This indicates that any differences are likely due to the natural environment and not anthropogenic factors.

**Name:** Bansari Patel

**Title:** *PCR Amplification of the mecA Gene from Bacterial Isolates Obtained at a Salt Marsh in Oceanside, NY*

**Faculty Advisor(s):** Dr. Jonna Coombs

**Abstract:** Peptidoglycan is an essential component of bacterial cell walls. It is assembled by cross linking which is catalyzed by penicillin binding protein. When penicillin is present at the active site of this protein, cross linking cannot occur. The beta-lactam structure of penicillin does not bind at the active

site of penicillin binding protein 2A, which allows cross linking to proceed. The purpose of this study is to determine if the *mecA* gene, a gene encoding penicillin binding protein 2A, is present in bacteria isolated from a salt marsh in the Oceanside Nature Preserve in Oceanside, NY. Seawater, Cellobiose, Tryptone and Yeast Extract (SCTY) medium was used to culture the five bacterial isolates. DNA was extracted from each of the isolates using the QIAamp DNA Mini Kit and PCR was conducted using *mecA* forward and *mecA* reverse primers to amplify the *mecA* gene from the bacterial isolates. Optimization was performed using a gradient PCR protocol on the 4E white bacterial isolate. DNA yield was not as high as expected, and it was difficult to conclude if the *mecA* gene was present in the isolates. The goal for future research is to further optimize PCR conditions for the amplification of the *mecA* gene. When amplicons of the correct size are obtained, they will be subjected to DNA sequence analysis.

**Name:** Emma Ryan, Katherine Alverado, & Frances Fan

**Title:** *Rapamycin as potential treatment for succinate dehydrogenase deficiency in Drosophila melanogaster*

**Faculty Advisor(s):** Professor Eugenia Villa-Cuesta

**Abstract:** Already emerging as a potential avenue for various medicinal therapies, the macrolide rapamycin operates as an inhibitor of the mTOR pathway, regulating cellular activities such as metabolism, longevity, and proliferation. This ability to modulate organismal metabolism, although not fully understood, is seemingly reliant on rapamycin's communication with mitochondria. An example of this suggested relationship is demonstrated through studies conducted on *Drosophila melanogaster*. After exposure to rapamycin, their mitochondria exhibited elevated oxygen consumption and succinate dehydrogenase activity with a simultaneous reduction of reactive oxygen species (ROS). Because of these salubrious effects, rapamycin has been proposed as a mode of treatment for various debilitating mitochondrial disorders present in conditions such as Leigh or NARP syndromes.

The objective of this study is to determine whether rapamycin is a viable treatment for irregularities in the aforesaid enzyme succinate dehydrogenase, the second complex of the mitochondria's electron transport chain (ETC). To achieve this, *D. melanogaster* mutants with defects in subunit B of succinate dehydrogenase (SDHB) were exposed to rapamycin and evaluated on their climbing abilities, oxygen consumption, and longevity. While several aspects of the mitochondrial pathology persisted, rapamycin was successful in mitigating some complications from the defective SDHB. The results obtained suggest that, although more investigation is necessary, rapamycin may be utilized as treatment for mitochondrial disorders.

**Name:** Rheba Sam

**Title:** *The effects of Rapamycin in lethality and retinal neuron degeneration in Drosophila SdhA mutants*

**Faculty Advisor(s):** Dr. Eugenia Villa-Cuesta

**Abstract:** Alzheimer's disease, Parkinson's disease and Leigh syndrome are severe conditions which are associated with roots in mitochondrial dysfunction. Among the various mitochondrial disorders, mutations that affect oxidative phosphorylation have devastating health consequences. In particular, a homozygous mutation in the gene that encodes for subunit A of the protein succinate dehydrogenase, SdhA, provokes lethal effects during embryogenesis. Homozygous SdhA retina cells obtained by clonal analysis have excess reactive oxygen species, leading to neuronal degeneration of retinal axons. Previous research has shown that rapamycin-mediated treatment decreases levels of reactive oxygen species in *Drosophila* (Villa-Cuesta et al., 2014). In this research we will test the hypothesis that rapamycin-mediated treatment will rescue the lethality associated with the SdhA mutation and

counteract the degeneration of neurons. We aim to accomplish this by treating *Drosophila* flies with various concentrations of rapamycin during embryonic development. In addition, we aim to examine whether the pathology involved in defective retinal neurons of *SdhA* mutants are able to be rescued by rapamycin. *Drosophila* retinal neurons are advantageous for study due to extensive identification of the synaptic connections involved in pathology of photoreceptor cells, which resemble the pathology of such neurodegenerative diseases.

**Name:** Navindra Tajeshwar

**Title:** *Effect of Plant Hormone Cytokinin on the growth of the Green Algae Chlorella vulgaris*

**Faculty Advisor(s):** Dr. Alexander Heyl

**Abstract:** Millions of years ago aquatic plants began to conquer land. Accomplishing this incredible transition required many changes in growth and key regulating processes to adapt from the ocean to the new environment. In plants mediators of the process of growth and development are called phytohormones. One such class of phytohormones are cytokinins, which are adenine derived phytohormones that promote cell division and key developmental processes. Nitrogen-containing molecules such as adenine have been shown to augment plant growth, therefore it is not clear whether the full cytokinin's structure or the adenine portion is what increased growth of algae. This study aimed to gain insight into this uncertainty. The model aquatic plant *C.scutata* was used to examine the different effect of regular adenine or the cytokinin iP in varying concentrations on growth. *C.scutata*, was chosen for this experiment due to its apical growth allowing for easy measurement of growth and due to the belief that it is the closest living relative to the land plants. Preliminary research conducted indicated that both the adenine and iP concentrations conferred growth although iP's effect was more profound.

**Section C: 10:50-11:50**

**Session 21: UC 211-212**

**Life Sciences III - Oral Presentations**

### **Graduate Division**

**Name:** Richard Sejour

**Title:** *The role of SIRT4 on the Rapamycin-mediated reduction of Oxygen Consumption*

**Faculty Advisor(s):** Dr. Eugenia Villa-Cuesta

**Abstract:** Sirtuins are a class of post-translational modifying proteins that are vital in health regulation. In mammalian cells, Sirtuin 4 (SIRT4) has catalytic functions making it an antagonist of oxidative metabolism by interfering with key anaplerotic processes of the Krebs Cycle. Appropriately, SIRT4 is normally localized within the mitochondria. Rapamycin, a drug that inhibits the mTOR pathway, has been known to enhance mitochondrial metabolism through interactions with SIRT4. Studies have also linked Rapamycin to the reduction of in vivo oxygen consumption within *D. melanogaster* strains; however, flies containing *D. melanogaster* nuclear DNA (nDNA) and *D. simulans* mitochondrial DNA (mtDNA), through a process known as introgression, did not respond to Rapamycin. Thus, the focus of this research is twofold; to determine if the function of Rapamycin, in *Drosophila*, is dependent on SIRT4 activity, and to characterize the activity and role of SIRT4 within introgressed strains. It is hypothesized that the absence of SIRT4 would reduce, if not eliminate, the efficacy of Rapamycin. To achieve this, *Drosophila* were transgenically manipulated to express the normal activity of SIRT4 (control) and the

deletion of SIRT4 (SIRT4?). Our experiment involves mutant and control strains of *D. melanogaster* mtDNA (Zim53 and OreR) and a strain with introgressed *D. simulans* mtDNA (SM21). Our data suggests that Rapamycin is dependent on SIRT4 to properly reduce oxygen consumption in vivo. Further studies will investigate the role, if any, that SIRT4 plays in the cross talk/communication between the nucleus and mitochondria. Since Rapamycin treatments are crucial in maintaining homeostasis, understanding how it is regulated may open new avenues for ameliorating metabolic disorders.

### **Undergraduate Division**

**Name:** Jason Shah

**Title:** *The effects of Withania somnifera root extract on prokaryotic and eukaryotic cells*

**Faculty Advisor(s):** Dr. Jonna Coombs and Dr. Benjamin Weeks

**Abstract:** The root extract of *Withania somnifera* has been shown to have significant antimicrobial properties against common bacteria. It has been also shown to be highly beneficial in studies involving its effects on brain cells and neuronal outgrowth. The root extract of *W. somnifera* contains Withanolide A, a steroidal lactone which is believed to be responsible for the antimicrobial properties exhibited. It's also hypothesized to play a role in promoting neurite outgrowth. A neurite outgrowth assay was performed on PC12 neuroblastoma cells. Preliminary results indicated that the root extract promoted neurite outgrowth. Antibiotic resistance is an impending crisis in the medical community with many beta-lactam antibiotics having limited effectiveness against common bacteria.  $\beta$ -lactam antibiotics target bacteria by binding to penicillin binding proteins (PBP), which catalyze the formation of peptide bridges in the peptidoglycan layer of bacterial cell walls. Binding blocks the PBP active site due to the similarity between the chemical structure of beta-lactam antibiotics and the structure of peptidoglycan precursors. In bacteria where resistance is exhibited toward  $\beta$ -lactam antibiotics, the antibiotic is unable to bind due to either physical changes in the protein structure or an enzyme called  $\beta$ -lactamase which degrades the structure of the antibiotic. In this study, five common bacteria (*Staphylococcus aureus*, *Staphylococcus saprophyticus*, *Escherichia coli* H, *Escherichia coli* B, and *Bacillus cereus*) which have previously been shown as having  $\beta$ -lactam resistance were tested with *W. somnifera* root extract in combination with ampicillin to determine if the extract acted synergistically with the antibiotic to inhibit bacterial growth. The preliminary results of disk-diffusion assays and minimal inhibitory concentration tests provide evidence of bacterial growth inhibition, additional experiments are currently underway to validate the results using statistical analysis.

**Name:** Rohit Singla

**Title:** *The Effect of Retinoic Acid on Jaws and Teeth of Axolotl Salamanders*

**Faculty Advisor(s):** Dr. Andrea Ward

**Abstract:** This experiment studies the effects of retinoic acid on jaw and tooth development in axolotl salamanders. It is well known that retinoic acid influences the genetic networks that control tooth and jaw development. I hypothesize that varying levels of retinoic acid will have an effect on tooth count, jaw/dentary length and jaw angle. More specifically, I expect that increased concentrations of exogenous retinoic acid will lead to a decrease in tooth count, jaw/dentary length and jaw angle. I believe that this increased level of retinoic acid will do the same thing as inactivating FGF, its antagonist, which had those effects. Given the rise in environmental contamination of retinoic acid from pimple and anti aging creams, it is critical to understand how this molecule affects early development.

### **OTHER SOCIAL SCIENCES**

**Section A: 8:30-9:30**

**Session 5: UC 215**

**Other Social Sciences I - Oral Presentation**

**Undergraduate Division**

**Name:** Valerie Fiore

**Title:** *The Effects of Nutrition and Art Therapy on Stress in College Students*

**Faculty Advisor(s):** Adjunct Professor Argiro Agelarakis

**Abstract:** Creativity has been on the rise recently in the form of adult coloring books and 'do-it-yourself' art projects, along with other types of independent activity, such as the creation of blogs and journaling. These art-based therapies have been used periodically in cancer patients to observe decreasing rates of cancer-related stress, as well as the relief of some symptoms. (Nainis et al., 2006; Monti et al., 2006) In conjunction with the previous statement, maintaining dietary needs is essential to proper bodily function and enhances motivation, relieves stress and even lightens mood (Bodnar & Wisner, 2005; Benton & Donohoe, 1999) There is a correlation between both nutrition and artistic creativity on stress levels. (Stuckey & Nobel, 2010; Takeda et al., 2004) Even though, recent studies were conducted on children and older adults, not many have been done on a population that is well-known for higher-than-average levels of stress: college and university students. (Eisen et al., 2008; Jackulj et al., 2007; Sauder et al., 2012) A sample of 10 college students, aged 17-23, will be directed to maintain a normal dietary intake for a week in accordance with FDA standards. (U.S. Food & Drug Administration, 2013) These students will reserve approximately 30 minutes daily for a creativity session of their choice, which may entail drawing or coloring. The sample will be given a pre-week survey that will analyze stress levels, coping strategies, social/alone time, and dietary habits prior to the week and a post-week survey to analyze stress levels, outlook on life, and motivation for the future post-week. If students proficiently comply and maintain healthy eating habits as well as reserve time for independent art therapy sessions, it is expected that stress levels will significantly decrease.

**Name:** Margaret Kritikos

**Title:** *The Significance of Scientific Illustrations*

**Faculty Advisor(s):** Adjunct Professor Argiro Agelarakis

**Abstract:** Scientific illustrations allow one to further polish and hone analytical and observational skills necessary for scientists to analyze and interpret detail. In biology, it is important to record observations by means of drawings. Scientific illustrations aim to explore the process of seeing and gathering information. Illustrations aid readers to connect information with graphic depictions; to visualize concepts and further understand research. Over a century ago, the ability to draw was necessary. Biology college students were required to take a daily drawing class to acquire a thorough understanding of biological processes, anatomy, and structural diversity. The ability to see without bias and focus on detail and pattern require training, not talent. Detail helps to differentiate between species, flora, and fauna. Various techniques are used such as pen and ink, pastels, colored pencils, watercolor, and paint. Three main types of drawings include habit "sketches," to illustrate the entire organism, low plane drawings, which show the basic plan of sections of specimens, and high powered detailed drawings which show detailed cells within a section of a specimen. For my poster presentation, I will illustrate four different types of flora to prove their scientific and medicinal properties. These herbs can be made into infusions, decoctions, syrups, powders, tinctures, essences, ointments, and poultices.

The passion flower, *Passiflora incarnate*, as a sedative to treat nervousness and sleeplessness; the lotus, *Nelumbo nucifera*, to treat bleeding disorders; the Madagascar periwinkle, *Catharanthus roseus*, contains anti-diabetic and anti-cancer properties; and basil, *Ocimum basilicum*, for indigestion, flatulence, and contains anti-cancer properties.

**Name:** Jorge Varon

**Title:** *Cultural Appropriation & Racial Prejudice: Modern Day Imperialism*

**Faculty Advisor(s):** Doctor Devin Thornburg

**Abstract:** This study is focused on how cultural appropriation is a form of racial prejudice resulting from cultural appropriation being a form of modern day imperialism. This is examined through the cross-examination of the the social psychology principles of social learning, realistic group conflict, and social identity. Current media attitudes towards appropriation and the cultures being appropriated are also referenced throughout in regards to their relation to the three principles. Social Learning theory explains how appropriation is spread through normalization of appropriation related behaviors in the media. Realistic Group Conflict theory describes the imperialistic roots of cultural appropriation in terms of competing groups. Social identity theory looks at how some individuals will appropriate cultures but will still be insulted when their own culture gets appropriated. All three theories are also looked at in regards to how they stem from an innate group power dynamic. Supporting this theory of appropriation as modern day imperialism, 15-30 participants from Indian, Asian, Native American, and Black cultures were interviewed and surveyed on their cultural identity, and how appropriation affects their self-perception. Whether or not cultural appropriation is necessary for cultural evolution is also considered in regards to prejudice and its utilitarian nature in terms of social progression.

**Section A: 8:30-9:30**

**Session 6: UC 216**

**Other Social Sciences II- Oral Presentation**

**Undergraduate Division**

**Name:** Tye Morrison

**Title:** *Foreign exchange rates and their affect on multi-national corporation growth*

**Faculty Advisor(s):** Devin Thornburg

**Abstract:** I will be reviewing the current literature on multi-national corporations based on three main segments; transaction, translation, and economic. These three factors are responsible and cause all multi-national corporation to look not only at potential business opportunities abroad but also the currencies these countries operate in. Given that today's markets allow corporations to stabilize risk with Future and Forward swaps, foreign exchange risk is still unpredictable. Whether its China devaluing their Yuan or crashing oil prices destroying oil rich nations, business abroad produces risk. I will be conducting a thematic analysis of these studies for additional factors that might influence foreign exchange exposure of these companies.

With that being said I am going to look into the impact of foreign currencies and exchange rates within FedEx, as well as the exposures that FedEx faces on a daily basis. Are these unpredictable rates a deterrent of growth in today's economy? Also, what has been implemented and what new fronts will



be created by these large multi-national companies to combat and decrease foreign exchange exposure on a global front?

**Name:** Jonathan Sclar

**Title:** *Europeanization in Palestine*

**Faculty Advisor(s):** Professor Katie Laatikainen

**Abstract:** The European Union is the highest paying donor to Palestine. Part of the European Neighborhood Policy, the EU applies political conditionality to Palestine in hopes of bringing them closer to civil society, democratization, and peace in the Middle East. Europe's role in Palestine has ramifications for Israel and the entirety of the Middle Eastern region. This paper analyzes the policy and implementation of the policy. Finally, I apply the theory of Europeanization to the EU's foreign policy in Palestine.

**Name:** Oleksandra Vlasova

**Title:** *New vs Established Nonprofits: The different value of establishing competence vs warmth*

**Faculty Advisor(s):** Professor Zachary Johnson

**Abstract:** The present study looks at two types of communication strategies: the one signaling warmth (intent) versus the one signaling competence (ability to carry out the intent); and how these strategies provide value to nonprofit organizations that are either newly formed or long established.

Depending on the stage in their lifecycle, organizations have different challenges. Newer organizations have a high probability of failure as donors question their capability, while established organizations may lose their initial warm image.

Organizations often are viewed like people (Fournier, S. 2012; Aaker, J. 1997). Thus, this study draws upon person-to-person research in order to discuss message types that ameliorate the weaknesses nonprofits face at these different stages. In particular, messages promoting efficiency and skill point to competence, which we hypothesize are more valued for new nonprofits. By contrast, messages promoting good social impact point to warmth, which is more valued for established nonprofits.

This paper proposes a two (competence, warmth) by two (nonprofit life stage: introductory, established) association between objects design to explore this relationship.

**Name:** Grace Zhang

**Title:** *A Historic Turning Point of China's Stock Market*

**Faculty Advisor(s):** Dr. Michael J Driscoll

**Abstract:** The Chinese stock market has received massive media attention for its 2015 slump, which started in late June. When China Securities Regulatory Commission acted to reduce leverage in late June, the bull market since the second half of 2014 ended abruptly. Within a historic week (July 6 to July 10, 2015) of China's stock market, which evaporated nearly \$3.9 trillion of market value up to the closing point of Friday's trading, the Chinese government reacted quickly and launched bailout policies with tremendous amounts of capital, which turned out to be much needed. Then the period began when the Chinese yuan experienced continuous devaluation, which sent the stock market into turmoil again at the beginning of 2016. Therefore, we are witnessing a historic turning point of China's stock market from June 2015 till now. Positive restructure is currently underway as China gradually opens up its financial

markets with the announcements that yuan to be included into the International Monetary Fund (IMF)'s Special Drawing Rights (SDR) in November 2015, and overseas investment to be able to participate in the Qualified Foreign Institutional Investor program (QFII) in February 2016. Already deeply interconnected as the global financial mechanism is, China is increasingly swaying its own influence on the world stage. It is a learning process for China to gradually integrate into the international monetary system as it "crosses the river by feeling the stones" (摸着石□□河), as said by Deng Xiaoping, the Chinese revolutionary and statesman. The ultimate goal is to establish an open, transparent, stable and healthy financial market.

**Section B: 9:40-10:40**

**Session 9: UC 201**

**Other Social Sciences III - ePoster Presentation**

**Undergraduate Division**

**Name:** Dalia Gladstein, Christina DeBlasio, & Brianna Delzell

**Title:** *BioArchaeological Assessments of Cremated Human Remains Found in Handra-Style Urns from the Hellenistic Period in Rhodes Island, Greece*

**Faculty Advisor(s):** Professor Anagnostis P. Agelarakis

**Abstract:** Forensic anthropology analyses on the contents of 19 Handra-style funerary vases, discovered at the Hellenistic component of the ancient necropolis of Rhodes and dated between 323 and 280 BC, revealed cremated remains (cremains) of 21 human individuals. Osteological analyses of the cremains, based on bioarchaeological methodologies with emphasis in funerary archaeology yielded important data on the demographic dynamics of the population sample involved and on aspects of the burial custom of cremation in ancient Rhodes. It appears that cremains had been deposited within the Handra-style vases in anatomic order simulating standing positions for the individuals involved; a funerary practice reported to date only from the Late Iron Age (900-780 BC) burial grounds of Eleutherna-Crete and Paroikia-Paros islands. Further, the degree of cremain anatomic representation from cranio-dental and infracranial loci, in addition to the pattern of simulating standing anatomic positions within the urns suggested the involvement of funerary specialists during the processing of cremains before interment; also reflecting on ideational components of the burial custom by symbolically addressing the articulated skeletal body needs of the dead in their quasi-physical afterlife state in Hades. This project, aiming to elucidate additional aspects of the human condition during the Hellenistic period in Rhodes focuses on intra-group dynamics of the demographic and paleopathological profiles of the population sample involved; comprising age subcategories between the Young Adulthood (18-25 years) and Maturus (45-55 years) cohorts, hence lacking Subadult (<18 years) cohorts, yet dominated by individuals of male biological sex but without excluding females. Further, particular attention is paid in the intra-male and intra-female subgroup dynamics regarding the relative distribution of palaeopathological manifestations, of acquired to degenerative causative agents.

**Name:** Laura Jacobsen & Lynne Hundhammer

**Title:** *Analysis of the Population of a Late Minoan Burial Cave, 13-12th Century B.C.E.*

**Faculty Advisor(s):** Dr. A.P. Agelarakis

**Abstract:** This presentation addresses bioarchaeological data relative to human skeletal remains

excavated from a cave tomb at Kalo-Chorio in the Aposelèmis gorge in Central Crete-Greece. The site dates to Late Minoan IIIB, an important, tumultuous period of the last phases of Mycenaean rule in Crete with many unanswered questions regarding aspects of the prevailing human condition. Our osteological laboratory research, based on methodological approaches of Bioarchaeology & Forensic Anthropology, revealed that the skeletal remains comprised secondary burials; the burial cave was an ossuary. Considering anthropogenic & taphonomic conditions, the remains were anatomically incomplete, fragmented & comingled, presenting challenges in the analysis & allocation of skeletal fragments to parent skeletons. Therefore the primary unit of analysis was designated the single cranio-infracranial human bone. Following all anatomic identifications, a minimum number of individuals was assessed to be 20. Assessments on demographic dynamics regarding biological sex subgroups indicated the involvement of 5 (25%) males, 13 (65%) females, & 2 (10%) indeterminate. Age assessments showed the collection primarily comprised an adult population. A majority of the remains were broadly categorized to be "General Adults" (18-45y); however, several fragments displayed morphological & pathological characteristics of older age categories. The youngest individual present was assessed to be 17/18-.

**Name:** Maki Lahori & Tony Halsteindal

**Title:** *The Social and Economic Benefits of Syrian Refugees in Europe*

**Faculty Advisor(s):** Professor Thornburg

**Abstract:** The media depiction of the Syrian refugee's crisis have shown the refugees as a burden to their host countries in Europe with many not knowing whether or not to accept or refuse these massive influx of refugees. However, it is important to understand the economic and social benefits of refugees and how they can play a role as an asset to society. Studies and research have shown that refugees can create economic value by working and alleviating the economic burden of their host country. In addition, socially, refugees can bring diverse skills and knowledge with them that can be utilized to benefit the local people such as health professionals and teachers, who, even in limited numbers, can make a significant contribution in remote areas. In our research we will discuss the economic and social benefits of accepting refugees and the role they play in helping their host nations, such as Germany and Norway, grow and prosper. For this study we will review and analyze the current literature out there from mainly secondary/ tertiary sources and in addition, conduct a short survey of the international/exchange students on campus to see their views on refugees coming into their native countries.

**Name:** Jaclyn Mancini & Karla Hernandez

**Title:** *Campus Climate Survey: Student Responses to Issues of Race on Adelphi's Campus*

**Faculty Advisor(s):** Dr. Devin Thornburg

**Abstract:** The purpose of this research is to determine Adelphi University's overall campus climate regarding racial and social justice issues. It is important that universities such as Adelphi reflect an inclusive and positive environment for all students. The main hypothesis of this study is to discover any disconnect, feelings of exclusion or microaggressions, that there may be between students of color and the University or other students on campus. The study consists of Adelphi University students between the ages of 17-22. It is a mix of male/female and the racial/ethnic background of students include: African-American, Latino/Latina, Asian, White and so on. The study consists of a qualitative survey design consisting of multiple short answer questions. There have been 39 student responses, but the survey is going to be refined and distributed to greater numbers of Adelphi students. The survey will then

be synthesized and the results will be distributed and presented to active clubs, organizations, and classes at the University. The broader implication of these results is to change the campus climate for the better by reducing or negating the disconnect between students of color and their peers. The result will be to further the inclusion and acceptance of students of color on campus and to further educate participants on the disconnect that exists.

**Name:** Kaitlin Shahinian & Alexander Bautista

**Title:** *Susitna Valley Late Holocene Archaeological Site Analysis In Alaska*

**Faculty Advisor(s):** Professor Kathryn Krasinski

**Abstract:** Dena'ina are Alaska Native Athabaskans that live on the coasts of Southcentral Alaska and maintain a sedentary lifestyle. Traditionally mobile hunter-gatherers, Dena'ina have occupied a territory of roughly 41,000 square miles around Cook Inlet for approximately 1,000-1,500 years. Archaeological research in the Cottonwood Creek area of western Knik Arm has yielded features showing signs of repeated or continuous land use from past Dena'ina settlements, signs of the transition to a fully sedentary culture which intensively harvested salmon. Based on basic collector behaviors, Dena'ina house pits are usually found surrounded by associated cache pits. The various depths of the pits also indicate the relative age of the site. Dena'ina sociopolitical complexities suggest wealth was associated with cache pit frequency; a higher number of cache pits should reflect the superior status of the individual(s) within society. By assessing pit size, depth, and frequency in association with housing units, we demonstrate the initial development of social inequality amongst otherwise egalitarian hunter gatherer societies.

**Name:** Alexandra Wurglics

**Title:** *Engaging the Visitor Through Museum Lesson Plans: A Case Study of the Heritage Museum of Epirus*

**Faculty Advisor(s):** Professor Anna Konstantatos

**Abstract:** During the 20th century, museums evolved from places that simply displayed collections to institutions in which learning was expected to take place. Presently, museums have turned to informal learning by encouraging visitors to incorporate their own cultural backgrounds to enhance their understanding of objects. This "meaning-making," as coined by George Hein, is the main cog in the constructivist museum wheel.<sup>1</sup> The Heritage Museum of Epirus (HME), located in Astoria, Queens, is an ethnographic museum that displays traditional textiles and other objects from Epirus, Greece, but has yet to create educational programs. This research project aims to develop original lesson plans for students in grades 5, 8, and 11 so that they can learn about the HME's objects while simultaneously drawing on their cultural and personal experiences to address the essential question "Why are the artifacts in the museum significant?" Each lesson plan – crafted by conducting scholarly research about educational theory and constructivist museums – suggests activities and discussions to help student visitors get "closer" to the objects while also encouraging original thinking about object significance at the HME. The plans are then evaluated using Hein's "Theories of Education" graph (which outlines active versus passive learning and ways in which knowledge is actually learned) to demonstrate that they are suitable to enhance the museum and its message.<sup>2</sup> Ultimately, this project aims to show that, even on a small scale, educational programs can be implemented in museums to further engage visitors and enhance learning.

1G. E. Hein, "Museum Education," in *A Companion to Museum Studies*, ed. S. MacDonald, (Oxford: Blackwell Publishing, 2006).; 2Ibid.

**Section C: 10:50-11:50**

**Session 22: UC 313**

**Other Social Sciences IV - Oral Presentation**

### **Graduate Division**

**Name:** Emily Meritz

**Title:** *If Forrest Gump is Not Real, Then Why is He in Our Classroom?: The Use of Film in Secondary Social Studies Education*

**Faculty Advisor(s):** Professor Diane Caracciolo

**Abstract:** In today's digital society, we see more often than not students looking for the big screen version of the books they are assigned to read or the topics they are supposed to learn about. As production value improves, instant access and availability to film increases, and we journey further into the digital age, should not we consider what role film has in the classroom? The purpose of this mixed-methods study is to evaluate the use of film in secondary social studies education. Through surveys and interviews with secondary social studies teachers, the goal of this study is to understand how educators view the use of film in the social studies curriculum. The data from the surveys and interviews will reveal which films are most commonly shown in the classroom and the reasons behind their selection. In addition, descriptive data will be examined in order to explore effective teaching strategies in the use of film.

### **Undergraduate**

**Name:** Elizabeth Rilling

**Title:** *Partisan Politics and Threat Multipliers*

**Faculty Advisor(s):** Professor Devin Thornburg and Professor John Drew

**Abstract:** In recent years, the United States political system, especially at the federal level, has seen an increase in partisan division and the polarization of politicians. Politicians participating in the race for their party's nomination for the 2016 presidential election have highlighted this alarming characteristic of the US political climate. One pattern that has emerged from these candidates' rhetoric is the oversimplification of issues which can be seen as "threat multipliers," or phenomena that exacerbate pre-existing issues in an unprecedented or unpredictable manner. Both major political parties are guilty of using threat multipliers as a means to attribute many problems to one single issue which they believe should be given priority over others. This paper will explore this phenomenon and its impact on political thinking and polarization in the US political system. To explore this topic, two main examples will be examined from each political party. On the Democratic side, the claim that the growth of terrorism worldwide can be attributed to climate change will be examined while on the Republican side, proposed anti-immigration policies as a means of solving domestic economic problems will be analyzed. In these cases, both climate change and immigration can be considered threat multipliers because they put strains on current systems and alter conditions to impact preexisting issues.

**Name:** Sebastian Souchet

**Title:** *Democracy and Anarchism: Sheldon Wolin's Democratic Theory*

**Faculty Advisor(s):** Professor Traci Levy

**Abstract:** In light of the recent challenges in the political science literature to the notion of a democratic United States on the basis of comprehensive analyses of both the distribution of economic power in the U.S., and the socioeconomic class bias of legislation passed by Congress, a fundamental reevaluation of our contemporary political regime is necessary. Indeed, the time seems propitious to ask: Where do we, as citizens of what is conventionally considered to be the world's oldest continuous and functioning democracy, find ourselves politically? Utilizing the masterful and extensive work of democratic theorist Sheldon Wolin, this research launches a radical critique of American democracy, and establishes a reconceptualization of genuine democracy and its principles as being similar, if not nearly identical, to the principles of anarchism as conceptualized by anarchist political theorists and philosophers. While much literature in the field of anarchist political thought ascertains such similarities in principles and characteristics between democracy and anarchism, conventional and accepted perceptions and understandings of democracy—that is, as state-centered, capitalist, highly bureaucratic and hierarchical, with an established constitution and institutionalized political organizations and parties that compete in what are commonly considered legitimate “free and fair” elections for national political power and leadership—are entirely antithetical to such an assertion. Through an examination of Wolin’s theoretical work and his understanding of democracy, one discerns that in the contemporary anti-democratic era defined by what he identifies as “Superpower,” “inverted totalitarianism,” and the political apotheosis of corporate capitalism, genuine democracy can only be actualized in ephemeral or “fugitive” moments. These authentic democratic moments reveal that to be a genuine democrat is to be a political anarchist.

## **NURSING AND HEALTHCARE**

**Section A: 8:30-9:30**

**Session 2: UC 201**

**Nursing and Healthcare I - ePoster Presentation**

**Graduate Division**

**Name:** Jessica Barczik

**Title:** *The Accuracy of Hearing Tests Applications (apps) in Adults*

**Faculty Advisor(s):** Dr. Yula Serpanos

**Abstract:** Electronic applications (apps) for popular “smart” devices (e.g., iPhone, iPad) and online tests have recently been developed as a personal tool for screening hearing loss. However, further research is needed to determine if hearing screening apps can accurately indicate hearing thresholds for individuals. The purpose of this study is to compare which application and earphone transducer type accurately determines hearing thresholds in adults with normal hearing or hearing loss. Screenings using the uHear and SoundCheck apps will be administered through a smart device (iPhone 6s) using three different earphone transducers; insert earphones (Apple EarPod), mini headphones (Sennheiser Model PX100), and supra-aural headphones (Bose noise-cancelling headphones). An analysis of relationships using a Chi Square ( $\chi^2$ ) method will be completed to determine the categorical differences of hearing across frequencies between subjects with normal hearing versus subjects with hearing loss between apps and earphone type.

**Name:** Susan DeMetropolis & Daniel Brennan

**Title:** *Neurophysiological Indices of Semantic Processing in Individuals with Alzheimer’s Disease versus*

### *Healthy Aging*

**Faculty Advisor(s):** Reem Khamis-Dakwar

**Abstract:** Semantic memory; known as conceptual knowledge is an aspect of human memory that relates to general knowledge of objects, word meanings, facts, and people without any specific connection to time and place (Patterson et al., 2007). It is known that individuals diagnosed with Alzheimer's disease (AD) exhibit semantic memory deficits even in the early stages of AD (Salmon et al., 1999). Behavioral data was from the Arizona Battery of Communication in Dementia (ABCD) (Bayles & Tomoeda, 1993) which examined expressive language and comprehension skills via memory, story retelling, object description, and reading comprehension to get a baseline performance for each participant. The subtests of Confrontation Naming: nouns and Confrontation Naming: verbs from the Northwestern Naming Battery (Thompson & Weintraub, 2014) were also used to examine naming skills at the single picture level.

Preliminary data found no differences in naming actions versus objects at the single picture level in females with early stage AD as compared to age-matched healthy women. However, there were differences in episodic memory (i.e., immediate and delayed story retell, word learning, recognition, and recall) in which participants with AD could not perform delayed story recall and had difficulty recalling words in a word learning task. Also, linguistic expression (i.e., object description and concept definition) was more impaired in participants with AD in which participants would describe a picture of a common object (e.g., mailbox) by its function or superordinate category. The results of this behavioral study are being extended to add electrophysiology (EEG) to this study is to objectively assess the sensitivity of behavioral measures (e.g., ABCD) that are commonly used as speech-language pathologists to differentiate early-stage AD and healthy adults

**Name:** Mina Gafary

**Title:** *The Statistical Analysis of Catheter Associated Urinary Tract Infections (CAUTI) in Bladder Cancer Patients Post Cystectomy with a Neobladder: A Public Health View*

**Faculty Advisor(s):** Tonya Samuel

**Abstract:** Most acute care facilities are required by Centers for Medicare and Medicaid (CMS) or state reporting to monitor and report Catheter Associated Urinary Tract Infections (CAUTIs) to the Centers for Disease Control and Prevention (CDC) via the National Healthcare Safety Network (NHSN). In April of 2012, the CDC began to include irrigated urinary catheters in the CAUTI surveillance definition. With this new definition, a recent National and State Healthcare Associated Infections Progress Report from the CDC found a 6% increase in CAUTIs between 2009 and 2013. The aim of this study was to perform a statistical analysis to verify that patients who have neobladder surgery result in false positive urine cultures which are erroneously reported. Results of this retrospective study showed that patients with a neobladder continued to have gastrointestinal bacteria in the urine after urinary diversion surgery and frequently had positive urine cultures due to the presence of bacteria from the segment of the bowel used to create a new bladder. It was also found that reliance on urine culture outcomes for a determination of a CAUTI cannot only be inaccurate, but can result in the hospital being unjustly penalized. Furthermore, results demonstrated the benefit and increased accuracy associated with waiting 6 months to report CAUTI data resulting from neobladder patients. Neobladder CAUTIs accounted for 4% of all NHSN reported CAUTIs at MSK; therefore it is recommended that an intermittent positive urine culture with no negative sequale should not be immediately recorded as a CAUTI.

**Name:** Alexander Perissi

**Title:** *Attitude, Physical Activity and Fitness over 3 years*

**Faculty Advisor(s):** Professor Kevin Mercier and Professor Anne Gibbone

**Abstract:** Students' attitudes toward physical education can impact their participation in future physical activity. The research project involves a local school district that received a federally funded grant to enhance the physical activity and nutritional education of students in grades K-12. A requirement of the program is evaluation of the objectives; (1) Increase the amount of time students participate in physical activity to at least 60 minutes per day; (2) Improve student performance on health related physical fitness tests; (3) Increase the percentage of students who consume fruit two or more times per day and vegetable three or more times per day; and (4) Increase the percentage of students who achieve an acceptable BMI measurement. The data collected to evaluate these objectives consists of recorded pedometer step counts, 20 meter PACER test (aerobic endurance), complete physical activity recall sheet (3DPAR) and nutrition and attitude surveys. Changes in attitude toward physical education were examined as students progressed from upper elementary school (4th grade) through middle school (8th grade). Three cohorts of students (Cohort 1-Grades 4-6, n=97; Cohort 2-Grades 5-7, n=71; and Cohort 3-Grades 6-8, n=73) were followed across three years to examine changes in attitudes toward physical education. After an initial increase from 4th-5th grade, a significant decrease in students' attitudes toward physical education from grades 5-8 was observed, with a faster rate of change for girls than boys. This study addresses a gap in the research regarding the attitudes of students as they progress from 4th through 8th grades and expands upon previous findings identifying decreasing attitudes toward physical education as students' age, particularly for girls. Results will be compared to the data analysis of physical activity, fitness and nutritional findings in order to provide insight on recommendations for future evaluation methods and targeted interventions.

### **Undergraduate Division**

**Name:** Noelle Becker

**Title:** *Transition processes into higher education: experiences of a student with ASD in a supportive learning environment.*

**Faculty Advisor(s):** Professor Dana Battaglia Ph.D

**Abstract:** The adjustment into higher education can be an overwhelming undertaking for all students, but undoubtedly more so for those with Autism Spectrum Disorder (ASD). Balancing schoolwork while adapting to a new environment, a new schedule, and a new found independence can be paralyzing for students with ASD. Transitioning from high school to college life for people with ASD remains understudied. Students with ASD have a limited number of colleges with support programs to choose from. This study examines the structure, strengths, and weaknesses of Adelphi University's Bridges to Adelphi program, which has been designed to support students with ASD in the academic, social, and vocational domains of college life. Sharing the experience of one student with ASD in the Bridges to Adelphi program, this case study assesses how "Bridges" has influenced this individual's college experience. A semi-structured interview was provided to one individual with ASD from the Bridges Program who volunteered to participate. Results indicate that this individual has received support in the aforementioned areas. Informal discussion ensued regarding whether this participant believed that he received support in academic, social, and vocational skills, which will ultimately transcend to an independent and fulfilling life in the future. Future directions and implications are discussed.



**Name:** Erin Boyle

**Title:** *Facilitating Earliest Pragmatic Goals with Picture Books*

**Faculty Advisor(s):** Dr. Susan Lederer

**Abstract:** Language competency, according to Bloom and Lahey (1978, 1988), is achieved through the development and integration of language content (i.e., semantics/vocabulary), form (i.e., morphosyntax), and use (i.e., pragmatics). A toddler who is delayed in his development of language use, or pragmatics, will, therefore, be unable to attain language competency. Speech-language pathologists, then, are tasked with the objective of bridging the gap between the pragmatic delay and competency. Concerning the delayed toddler, there are many activities and procedures to facilitate language goals. Speech pathologists often use picture books and shared reading techniques to promote language but the focus is typically on vocabulary and grammar/syntax. This research aims to explore how utilizing shared reading concepts in speech therapy can facilitate the earliest developed pragmatic functions, as defined by Lahey (1988), in delayed toddlers. Sample lessons with pragmatic goals, selected books, and therapy techniques will be provided.

**Name:** Melissa Jacob

**Title:** *Examination of Transgender Health through the World Health Organization's International Classification of Functioning, Disability, and Health's Contextual Factors*

**Faculty Advisor(s):** Assistant Professor Steven Cox

**Abstract:** In Western societies, gender exists within a binary male/female system. An individual's sex is often assigned at birth according to the appearance of genitalia at that point in time. While many individuals find their gender identity congruent with their sex, transgender individuals experience a conflict between their gender identity and assigned sex.

Historically, the incidence of transgender individuals has been varied, but research indicates that this incidence will increase as a result of more social awareness and the creation of laws meant to protect transgender individuals. Despite awareness and protective laws, however, research also suggests that transgender individuals are highly stigmatized and experience abuse and discrimination as a result of the physical, psychological, and/or social changes that occur during their transition.

The pervasiveness of violence and discrimination in this population results in an increased risk for unique health outcomes. Further, medical needs alone do not fully address the breadth of health outcomes that transgender individuals may experience. Therefore, this presentation aims to identify barriers that can impact the physical, psychological, and/or social health of transgender individuals using the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health (ICF). More specifically, this presentation will use the ICF's Contextual Factors to explore the role of environmental and personal factors in transgender health.

**Name:** Neeta Jadonath, Christine Koyithara, Genna Giordano, & Lauren Bethon

**Title:** *The Effects of Surgical Safety Checklists on Surgical Errors*

**Faculty Advisor(s):** Dr. Claire Hauser

**Abstract:** Based on reports from The Joint Commission, wrong-site surgery was the most common sentinel event between 2004 and 2010; however, the surgical safety checklist has been effective in reducing the occurrence of errors in the OR. The surgical safety checklist designed by the World Health Organization was implemented in order to improve patient safety and prevent harm by briefing the OR team on the patient, surgical site, and other critical components of the operation. Through the reporting measures designed by the Centers for Medicare and Medicaid Services, trends in compliance and near-

misses were identified in order to reduce the risk of error recurrence. With the correct execution of the checklist by surgical teams trained in its use and importance, the National Patient Safety Agency found, in 2010, 68% improved patient safety and 41% more near misses as opposed to surgical error. Performing three surgical safety checks (sign-in, timeout, and sign-out) provided an opportunity for surgical team members to increase their awareness of the surgical site, clarify details of the surgical procedure, discuss and prepare for potential complications, and work as a well-coordinated team. As evidenced by the research examined, the proper use of the surgical safety checklist is effective in improving patient safety in the OR and preventing procedural errors by creating an environment of clear understanding, reduced variability, a culture of trust among team members, and active communication.

**Name:** Emma Kaye, Christin Philipose, Jane Lee, Kessiah Tolentino, & Jubbie Acutim

**Title:** *Does daily exercise or other physical activity during pregnancy reduce the risk of preterm delivery compared to those who do not exercise during pregnancy*

**Faculty Advisor(s):** Akhtar Ghassemi

**Abstract:** Background and Research Objective: The aim of all three studies was to examine the influence of an aerobic exercise program throughout pregnancy on gestational age and the effects on preterm. These studies aide education and prevention to women who wish to get pregnant and are pregnant. Subjects and Methods: Subjects consisted of pregnant women who practiced physical activity during pregnancy. Interviews, pre and post tests, hospital databases and computer programs were used to collect the data.

**Name:** Amandip Samra, Nicole Sogluizzo, Chandler Messina, Casey Hasher, & Marieta Yushuvayeva

**Title:** *In the geriatric population, has the implementation of electronic medical records decreased the occurrence of medication errors in the past 12 years?*

**Faculty Advisor(s):** Professor Edmund J. Y. Pajarillo, PhD, RN BC, CPHQ, NEA BC

**Abstract:** In the geriatric population, has the implementation of electronic medical records decreased the occurrence of medication errors in the past 12 years?

The geriatric population is extremely vulnerable to the occurrence of medication errors. Due to their age, these patients often incorrectly report which medications they are currently taking and these patients are commonly on multiple medications at one time. This can be dangerous as it can lead to new medications being prescribed that contraindicate with those medications they may already be taking. In the year 2050, it is anticipated that the geriatric population is increasing significantly because baby boomers, born in 1946 to 1964, are getting older (Ortman, 2014). In order to avoid an increase in medical errors, an Electronic Medical Record is implemented. The use of technology helps to prevent these undesired incidences.

Many scholarly articles and pieces of literature that support this claim were found on research databases such as EBSCO and PubMed. After conducting a systematic review upon articles where geriatric patients' medications were prescribed and inputted on an EMR, the efficacy of EMRs for geriatric patients can be determined. Due to the implementation of safety alerts while using the EMR, the amount of contraindications between prescriptions decreased (Peterson, 2014). Safety alerts pop up on the EMR when there is an error between the prescribed medications. EMRs also help to keep patient's information organized which aids in the efficacy of patient safety. During discharge, geriatric patients' medications reconciliation are inputted on an EMR to protect the patient's safety. The use of the EMR created less than 1 medication error upon discharge (Salnitro, 2012).

With the increase of the geriatric population in the past 12 years, it is essential to adapt the EMR

where geriatric patients are treated. The implementation of the EMR will continue to decrease the frequency of medica

## **Section B: 9:40-10:40**

### **Session 11: UC 215**

#### **Nursing and Healthcare II - Oral Presentations**

##### **Graduate Division**

**Name:** Sonia Falconer

**Title:** *An Examination of Patient Perioperative Wait Time and its Effect on their Attitude towards Perioperative Healthcare Professionals*

**Faculty Advisor(s):** Professor Edmund Pajarillo PhD, RN BC, CPHQ, NEA BC

**Abstract:** An Examination of Patient Perioperative Wait Time and its Effect on their Attitude towards Perioperative Healthcare Professionals.

**Introduction:** This proposal seeks to examine perioperative patients' wait time and its effect on their attitude towards perioperative healthcare professionals. Joonas and Wang (2012) stated that U. S. studies reveal wait time is inversely related to healthcare service outcome as well as patient behavior and attitude. The goal of this study will be to improve patient satisfaction. Longer wait time to see the physician correlated with decreased patient satisfaction (Teunis et al., 2015).

**Significance of the study:** Patient wait time is a chronic and continuing problem in healthcare (Joonas & Wang, 2012). A review of the literature showed the impact of long wait time on patients' attitude and emotions. Interventions will improve the quality of patient care. Michael et al. (2013) noted a strong and inverse relationship between patient satisfaction and wait time.

**Research design:** An examination of patients' perioperative wait time and its effect on their attitude and emotions is proposed, using a quasi-experimental one group post test only method. This design will be chosen as participants will not be randomized. This study is to pilot these interventions, results of which will be used in future larger scale, rigorous, and randomized studies. The dependent variable will be decreasing wait time and improving patient satisfaction. The independent variable will be a bundle of interventions meant to achieve the dependent variable. While waiting, participants will be allowed to keep electronic devices with headphones like cell phone, iPad, tablet, visual and hearing aids to keep them occupied by facilitate listening, reading and communication. Keeping patients occupied while waiting is a significant predictor of satisfaction (Sherwin & Evans).

##### **Undergraduate Division**

**Name:** Christie Delligatti, Inshan Alli, Veronica Kelleher, Nicole Napolitano, & Ashley Perez

**Title:** *Ventilator Bundles Reducing the Risk of Ventilator-Associated Pneumonia (VAP) in ICU Patients*

**Faculty Advisor(s):** Professor Edmund Pajarillo

**Abstract:** Introduction: Ventilator-associated pneumonia (VAP) is one of the most common complications associated with mechanically ventilated ICU patients. VAP is associated with an increased risk of sepsis and morbidity, as well as hospital costs (Keyt, 2014). The Institute for Health Improvement recommends the use of Ventilator bundles to help prevent VAP. These bundles include elevation of the head of the bed (HOB), daily sedation vacations and assessment of readiness to extubate, peptic ulcer

disease prophylaxis, deep vein thrombosis (DVT) prophylaxis, daily oral care with chlorhexidine (Al-Thaqafy, 2014), and subglottic secretion drainage ports (Hubbard et al., 2015).

Methods: MEDLINE/Pubmed and EBSCO databases were used to find relevant research studies. Search terms used to locate appropriate literature were ventilator-associated pneumonia, bundle, and ICU. Full text and scholarly review articles were examined and limited to within the last 5 years. An effective and accurate experiment was found in the Institute of Healthcare Improvement's (IHI) website. Ensuring compliance of the bundle. Collecting a sample once a week on all patients using the bundle. Samples have to be randomized. Continue to analyze patients and their perspective medical records in order to maintain compliance with the bundle. Following this process over the span of 52 weeks allowed for collection of an accurate baseline.

Expected Outcomes and Recommendation: Ventilator associated pneumonia, is a life threatening and costly nosocomial infection that can be prevented with the use of appropriate nursing interventions. It is possible to reduce VAP rates in ICUs through the Institute of Healthcare Improvement (IHI) model. However, a successful model can only be achieved with participation of the entire ICU staff over the year round utilization. It is anticipated that when used correctly, ventilator bundles on ICU floors will directly decrease the incidence of patients that acquire VAP.

**Name:** Alyssa Harper, Angela Park, Brianne Clark, & Jay Lee

**Title:** *Among pediatric oncology patients, is dog therapy in comparison to art therapy better as a coping mechanism?*

**Faculty Advisor(s):** Professor Edmund Pajarillo

**Abstract:** Introduction: Cancer is a very serious and complex disease that has become the third leading cause of death (CDC 2015). The physical and emotional roller coaster effect often seen in people who have cancer require different outlets in order to cope and deal with daily stress, such as chemotherapy and medication trials. Those outlets include dog therapy and art therapy providing the patients with different experiences; finding an outlet that offers the most positive outcome for the patients can change the ideas associated with these daily stressors.

Methods: The purpose of this evidence-based question is to determine which therapy is most beneficial for pediatric oncology patients. The John Hopkins Nursing Evidence Based Practice PET Process Model served as the basis for the report to understand the effects of both therapies. Medline and PUBMED were used to find a correlation between the two therapies and both show a decrease in levels of depression and an event to look forward to among the patients studied (Psycho-oncology 2007). However, the brief but interactive sessions with dog therapy has helped many patients decrease pain, feel less depressed about social anxieties, and have helped patients improve quality of life (NIH Urbanski 2012).

Expected Outcomes and Recommendations: Dog therapy will be most effective with helping pediatric oncology patients cope with their cancer. Dog therapy has provided positive outcomes and feedback within the pediatric oncology community. It has shown to stimulate and encourage the pediatric patients to interact with the external world. Although art therapy allows the patients to express themselves creatively, dog therapy allows these children to thrive in greater ways.